

**SPEECH BY MAJOR GENERAL THE HONOURABLE
MICHAEL JEFFERY, AC, AO(Mil), CVO, MC (Retd)**

**NATIONAL ADVOCATE FOR SOIL HEALTH,
CHAIRMAN, SOILS FOR LIFE**

**AT THE SOILS FOR LIFE WORKSHOP,
ABERCROMBIE BUSINESS SCHOOL, SYDNEY UNIVERSITY,
DARLINGTON, SYDNEY**

FRIDAY, 7 DECEMBER 2018 – 9.00 AM TO 1.00 PM

1. Good morning ladies and gentlemen.
2. I would like to recognise the original owners of this land and pay my respect to their elders, past and present.
3. Today we have an opportunity to discuss together the really Big Issues facing us – how do we work together to improve our soil, how do we get a focus on carbon, how to get it out of the atmosphere and back to where it belongs, in the soil, or as I heard recently at a conference at the Academy of Science in Canberra, in the oceans as well.
4. As Australia's National Soil Advocate and the Chair of Soils For Life, that answer is pretty obvious to me.
5. Soil – healthy soil, regenerated soil, active working soil, has a proven capacity to draw down carbon and keep it there, yet we've literally overlooked it in the national debate about climate change.
6. Simply put, I believe, along with a former Chief Scientist Robin Batterham, that healthy soils have the capacity to absorb, like a sponge, at least sufficient CO₂ to meet our Paris Agreement target, and accordingly we should be pursuing with the utmost vigour, a cheap, accurate, broad acre soil carbon measurement system.
7. Such a system may well demonstrate the possibility of neutralising Australia's total annual industrial emissions of around 550 million tonnes of CO₂, thus allowing a more orderly transition to renewable energy options, or even nuclear.
8. Some suggest that healthy soils may also have the capacity to catch up with the last 50 years' legacy emissions, but whatever the case, I don't think we have been focusing hard enough on the possible answer; sequestering carbon into our soils through enhancing our photosynthetic capacity.
9. At Soils For Life, we demonstrate how to regenerate, maintain and protect strong healthy soils through some 25 carefully selected and performance measured farming case studies. You will hear from two of our very successful case study farmers shortly. They have great stories to tell. Soils For Life intends rolling out 100 or more similar case studies in the coming 2-3 years, Australia wide.
10. These 25 innovative farmers have studied their landscapes closely, and worked out how to maintain permanent vegetation cover, retain more precious water in their soils – where it does its job - and reduce or, in some cases, even eliminate the use of fossil fuel inputs, chemicals, pesticides and inorganic fertilisers.
11. In so doing, they have successfully scored the healthy landscape trifecta, by integrating the management of their soils (microbial, nutrient and fungal function), their

water (the hydrology) and their plants (diversity, rather than monocultures).

12. Monocultures mine the soil - diversity enriches it.
13. Regeneration of our agricultural landscapes is a national and international imperative. We need to slow down the flow of water so it has time to sink into the soil, look to conservation tillage, manage cell grazing, rejuvenate our forests where appropriate, expand pasture cropping, and encourage crop rotation.
14. With integrated, regenerative landscape management, farmers store and retain large amounts of soil organic matter, which can remain in those soils for millennia. It is a fact that in our Australian agricultural landscapes, our soil carbon levels have decreased from a healthy 4%-5% at settlement to around 1% today and I suggest this is one reason why we are not maximising the retention of water in the soil.
15. There are, of course, various established methods of sequestering carbon in our soils and all contribute to making healthier soil and regenerating our landscapes.
16. Carbon is the unsung hero in the soil world and there is a lack of good information readily available for farmers on the way to hold carbon in the soil, rather than lose it through oxidation.
17. *There is, to my dismay, no co-ordinated, clear approach to measuring carbon in our soils, cheaply, accurately, quickly and broad acre. Yet soil carbon is a common indicator of soil health.*
18. Our soils can absorb and convert CO₂, but they can also have it squeezed out or oxidised, sending that CO₂ straight back into the atmosphere.
19. I talk to you today with a real sense of urgency, and some frustration.
20. According to Walter Jehne from Healthy Soils Australia, ***in the last 70 years*** our industrial forms of agriculture have accelerated carbon oxidation through excessive use of fire, non organic fertilisers, bio-cides, irrigation and fallowing.
21. It's not news to this audience that we must cool the surface of the planet to convert carbon oxidation to bio-sequestration, in order to regenerate the resilience and hydrology of the soil carbon sponge.
22. And we can do it, but only with an enormous, coordinated effort at grassroots, scientific and government levels.

23. Organisations like ours and Healthy Soils Australia set out the urgent steps we have to take:
 - a. Somehow, we must safely and naturally cool the regional and global climate through increased photosynthetic action to offset and buffer greenhouse warming;
 - b. EXPLAIN: Paddock, House, Tree, Car Park;
 - c. We must secure essential water and food, for the more than 5 billion people who are expected to live in urban areas by the middle of the century; and
 - d. We must regenerate the Earth's soil carbon sponge and its capacity to infiltrate and retain rainfall and sustain the growth and transpiration of bio systems, particularly forests across our landscapes.
24. So what have we done to the Earth? We've degraded half of the planet's soils by turning 5 billion hectares – or 40% of the land surface – into desert and wasteland.
25. We've polluted most of our great river systems and reduced their flows by damming.
26. In India, sub Sahara Africa, China and the Middle East we are steadily mining aquifers established over geological time. The Arctic Circle is on fire through perma frost melt.
27. There are many other agricultural landscape problems, but you can see now why I have a sense of urgency...
28. What we must do is to maximise photosynthesis and do it quickly by maximising the area of land under perennial green plant growth, including in our cities.
29. Our Soils For Life farmers – even those technically in drought – proudly show us paddocks and plantations with full ground cover, sometimes up to the knees.
30. Once we establish that vegetation cover, we have to keep it there permanently, and hence the need for selected native perennials that grow in our traditional summer months.
31. And we have to maximise the degree to which the fixed carbon is bio-converted into stable soil carbon rather than being oxidised back into the atmosphere through poor soil management, hot fires and so on.
32. Our Soils For Life farmers know this and are happy to share their knowledge. Unfortunately, many of their neighbours still continue with their old industrial agriculture practices, but the current drought is forcing them to ask questions of themselves, including

taking a look at the industrial land management practices we still continue to promote.

33. The future of our farmers, and the generations to come, depend on getting it right, to preserve, maintain and protect our landscapes, to maximise retention of our precious water, preferably in the soil and to build up carbon in our soil sponge.
34. But farmers generally can't do it on their own, they need information and support to 'give it a go'. They are often working in the vacuum of their own farms, or their own catchments, without being provided with a regional, national or global picture of how much carbon they are storing, or how little.
35. Our Soils For Life farmers provide "how to do it" information for others:
 - They've established diverse top cover year round.
 - They are controlling their stock levels through controlled cell grazing.
 - They are pasture cropping.
 - They are precision sowing.
 - They have slowed the movement of water from the hill tops and in their water courses so the water better filtrates their soils; and
 - Through all of the above they have maximised carbon in the soil as a very important requirement for water retention.
36. Some of you may have seen the Australian Story on Mulloon Creek and the late Tony Coote which explained this process very well.
37. And what about urban run-off. The average suburban home runs off around 350KL of rainwater per year. Surely our urban planners across the country should be directed by law to design systems that capture all of that roof run off and recycle it productively.
38. We face a major deficiency of qualified and enthusiastic professionals working in soil and food sciences, and a deficiency of young agricultural scientists on the ground, armed with the knowledge, to advise farmers on how to go about improving their hydrology, managing their landscapes better and maximising soil carbon.
39. It is not good enough that farmers now have to depend so heavily on a few local agronomists – good people, but often employed by companies that make their profits out of selling more of a particular product that is not necessarily the right solution to the

problem.

40. To deal with this, I suggest we need to urgently re-establish sufficient numbers of research stations in rural and regional areas, to service our 100,000 farmers, and employing young, well trained and independent agricultural scientists, who have a properly planned, long term career path. A love of such science could come from the establishment of a vegetable garden in every primary and junior high school in the country with a mandated syllabus, agreed by the Curriculum Council.

EXPLAIN: Mansor computerised soil research trailer.

41. Unfortunately, there've been too many conversations around farm kitchen tables which start: "Son, don't go into farming". And so, young people haven't seen agricultural science as a career, and we have to change that.

42. Let me conclude with some encouraging observations from the PM's recent drought summit held in Canberra.

43. It was an excellent occasion attended by the PM, Premiers, bankers, CSIRO, the NFF, the opposition shadow minister for agriculture and federal/state agricultural department heads.

44. The PM made it clear that he not only wanted to ensure that drought aid was being efficiently and quickly delivered, but he also wanted advice on how to help farmers better prepare for the inevitable future droughts.

45. I put it to the forum that farmers need to be better supported with knowledge and resources on the ground to get their soil, water, plant and animal assets functioning as an integrated whole, with good and transparent science to back them.

46. I suggested a national objective or aim "to restore and maintain the health of Australia's agricultural landscape through the integrated management of the soil, water and plants".

47. The PM said that he supported such an objective. I raised various other sub-sets to that objective which received considerable support, including from Joel Fitzgibbon, various premiers and Bob Katter.

48. A garden in every school received enthusiastic support including from the ABC's Macka.

49. I will now be following up post haste with the PM and Premiers.

50. FDR once said – “the nation that destroys its soil, destroys itself.” My contribution to today’s discussion for what it is worth is – “To save the planet, save the soil”.

51. Thank you.