

Notes from the online meeting on Food and Farming - July 2020

The slides show the questions that were submitted in advance of the meeting following the 'thinkpiece'¹ put together by Robert Campbell circulated to group members.



The questions suggested the following topics to guide the discussion and key points from the discussion during the meeting follow each slide. We didn't have time to cover all the questions.

Topics

- Soil
- Cattle
- Beef and dairy v plant based
- Rewilding
- Local food
- Making a difference globally
- Subsidies

¹ To be found at end of this document.

Soil

How do you try and encourage biodiversity on your land? Do you feel it is an important issue?

Do you know the CO2 footprint of the fertiliser you use? How easy is it to determine this?

How much run off of fertiliser do you experience? How easy/difficult is it to measure this, and what can you do to mitigate it?

According to Nicole Masters (ref her book For the love of soil) the UK has lost 84% of fertile topsoil since 1850. Currently we are losing 1-3cm per annum which equates to 3 million tonnes of topsoil. What can farmers do to reduce this?

At the Oxford Farming Conference in January 2019, [NFU President Minette Batters announced the NFU's ambition to achieve net zero for agriculture](#) by 2040. Do you think this is possible? What needs to be done to achieve this?

How can we, the general public, support regenerative farmers? Are there farmers groups that we could support? le NFU foods standards petition

<https://www.nfuonline.com/back-british-farming/campaign-news/food-standards-petition/>

Jenny Earle

Soil

In the past farmers have been forced to plough out grasslands in Dig for Victory vegetable campaign. This has led to soil loss and a reduction in the fertility of the soil. Robert advocates crop rotations including grass mixtures to pump carbon and nitrogen into the soil. In UK, many farmers are changing direction going back into rotations to deliver both diversity and a healthy soil. All plants inc. barley / wheat put their energy into the grain then die Some vegetables however are harvested rather than being allowed to "go to seed" same for grass. Grass tries to grow seeds, by allowing animals to eat it down, it carries on photosynthesizing to keep growing, and draws more carbon into itself, through roots down into soil.

Grass is a principle tool in soil loss reduction and a major soil improver. Soil is the biggest reservoir of carbon and evidence shows that land following 'grass crop' is more fertile.

In a "grass" fed rotational system we rarely need to use fertilisers and herbicides are rarely used if managed properly though thistles can be a problem along with other plants like the poisonous ragwort are sometimes seeded from untended verges. The dosages for pesticides are smaller these days and rarely used above half the manufacturers recommended rates

Cattle

Are British cows the villains they are sometimes portrayed as and if so what can be done to mitigate their role in climate change short of wholesale redirection of the industry?

Pete Smith

Cows:

Robert recommends the book 'Cows save the planet' by Judith Schwartz. There is a review of the book on the [Sustainable Food Trust's website](#). Robert says, "As a world we are eating too much beef" and "we should reduce the consumption worldwide by up to 50% according to a study of worldwide beef production". Carbon footprint of beef production is 2 ½ times less in UK due to good practice compared to countries where rain forest is converted to grassland or highly intensive systems are used Part of the problem is the obesity epidemic and the amounts that are eaten, particularly in the US. Therefore, Robert advocates eating beef but in moderate amounts.

Beef and dairy v plant based

1. Perhaps, more important, from a resilience point of view (due to the inevitable warming and 'deep adaptations' we are all going to have to make) is the *re-localisation of food and farming*; producing a balanced diet of crops, mixtures of meat and/or protein pulses, vegetables and fruit, with the ability to meet the needs not only of the CASaV area but for the towns and cities beyond, where enough 'local food' will be much harder to source. "Economic globalisation is setting us up for the mother all collapses" so says Prof. Jem Bendell....that will include the probability that global trading of 'food from abroad' will be harder to come by. ... (ref paper titled: "Why Deep Adaptation needs re-localisation")
2. And, *growing more trees*...if the land is being used to graze cattle, and to make hay for their winter food (and they do take a lot acreage, more presumably than protein pulses?) can we also find enough space for more forests and hedgerows...?
3. What about chicken manure and 'wild' protein for soil health?

Anyway, for me it's about 'finding the right balance' in how we are to live in, quite possibly, the last remaining decades of human habitation of the planet... at the same time as mitigating as much as possible further warming...

Amanda Brown

Chicken manure very strong so must be applied lightly, implied not really a substitute for cattle manure which contains more fibre. Robert said, "Incidentally I measured our hedges the other day and we have about 15 miles of hedge on our 800 acres. We cut these about once every three years and each hedge need up to five passes of the hedgecutter at about 1 mph Quite an expensive job for which we get no financial help."

Rewilding

As Robert says the issues are complex and often the wrong things are done for the right reasons, c.f. diesel, but equally have to also question vested interests as Roberts says.

While I agree that the best farming use for much of the land in the UK is to raise grass fed cattle, I suspect it is not the best carbon use. What does Robert think about the suggestion that much of the grass land should in fact be rewilded? I believe this would be better for carbon sequestration, recovery of our natural species and in the long term for people with a richer natural environment.

My other question to Robert is about scale. With respect for the soil and without huge inputs (fertiliser etc.) how much meat could the UK actually produce? How many meat meals a week could everybody have?

In terms of other type of cattle rearing, "There is no planet B" by Mike Berners Lee has some great statistics, over 50% of the arable crops grown in the world are fed to cattle. So without cattle we could feed almost double the world's current population, says nothing about carbon if all the crops are grown intensively.

Simon Gibbon

Grass and trees:

Grass crops have been used in Australia, North Dakota in the US and Zimbabwe and have helped with soil water retention. Undoubtedly too much arable crops are fed to cattle and a reduction in beef consumption could cure this as well as reducing obesity

Grass mixtures put carbon into the soil and increases the permeability of the soil. There is enough land for a mix of more trees and grass, but trees soak up the water and ground source water may not be replenished.

Trees are good for carbon capture whilst growing but not so good when mature.

Rewilding: see edge of trains tracks for rewilded areas - a lot of it becomes thick scrub. Also search online for Broadbalk and Geesecroft Wilderness these areas were originally wilded many years ago and their procession to their current condition monitored.

Local food

As a resident of Great Ayton, unable to travel to the bigger supermarkets, I am very dependant on the local Food Coop. Where the food comes from is clearly not of local origin, and certainly not locally farmed.

What is of great concern to me is the dependence on long food chains from elsewhere in the country and abroad. And more important the deteriorating quality of the food. Since the government has delegated all interest in food supplies to the big supermarkets healthy food is no longer available.

There are of course various local food chains in the Tees Valley, and in some cases local delivery is available, but expensive.

My real concern is the lack of concern for more dramatic climate changes and the lack of resilience to deal with them.

What is needed now is an action plan for available healthy food, linking this area to local growers.

Malcolm Davison

Seasonal/local:

All farmers produce to meet the needs of the market so as consumers we need to stimulate the market. Vegetable producers work hard to produce what supermarkets are demanding e.g. strawberries all year round. Air freight usually travels stowed underneath passenger sections of aircraft, so less airlines operating will mean very expensive to ship strawberries from abroad, flowers from Kenya etc. If produce from overseas becomes too expensive then eating based on the seasons will return. Localisation has to come however, need to consider whether it is more important to have local food that has a lower carbon footprint or food from further away.

It is also worth noting that expensive automation, regulation, and complex specifications to meet assumed consumer demand has meant centralisation of processing facilities. In our area, for example, Robert remembers at least four slaughterhouses while now there are none.

Making a difference globally

Many thanks for the writings and for taking time to circulate them and stimulate the discussion.

As an industrialist engineer I find it amazing that in this agrarian world things happen without human intervention. Your piece is a very nice, informed introduction to the chemistry of farming. (Unlike the naive propagandaesque poster in the email ... since when have factories belched black (read bad) smoke? -- CO2 isn't black anyway. Why not depict a white gas central heating boiler if you want to show the demon of climate change).

Last year, we moved into a house with a wonderful garden, very black soil. Reminds me of the fertile peat 'Moss's of south Manchester where I grew up (Moss Side). Contrast this with the sand deserts of Africa or America where nothing will grow.

In the end, destroying the Yorkshire countryside with monocrop vegan deserts and hundred acre fields (under solar panels and stationary windmills) is going to do nothing to influence China and America, let alone the developing world, and we shouldn't skew the economy to do so.

What *will* make a difference is a global trend to Nuclear power, electric transport and responsible farming.

Phil Barber

NFU trying to ensure animal quality, country of origin labelling very important. Trying to outlaw food coming in with lower health & welfare conditions than UK food. Eg "Hormone treated beef should not be allowed in this country"

Subsidies

Healthy soil definitely contributes towards the carbon cycle and taking CO2 out of the atmosphere but is the problem as much to do with the amount of land needed to feed animals?

Actually what I wanted to know is what Robert thinks would be the most effective form of subsidies for both the farmer, the consumer and biodiversity eg land management, biodiversity targets etc?

What concerns does Robert have over Brexit and the seemingly inevitable trade deal with the US?

Bridget Holmstrom

Subsidies:

Countryside stewardship used to allow for free space on farms but is no longer being used. New Environmental Land Management white paper with some kind of subsidy system will be needed for perceived environmental "goodies". Currently in state of limbo as transferring from one subsidy system to another. ELMS is now being tested in various experiments across the country and will take over from existing schemes in four years' time. Robert suggested that about 65% of land in the UK's best used for grass and animal grazing. For many years some of that land has been used for arable crops and has deteriorated and needs to be returned to grass.

Now is the time for you as consumers to influence it.

Thoughts on Farming and Climate Change

I was going to arrange to speak a little about farming as an introduction before you visit the farm in the summer, which I still hope will happen sometime. There are a few things I would have liked to discuss with you, so I have asked if this document could be circulated and would welcome questions and comment.

Just so that you all know I am a farmer producing Beef, Lamb, Wheat, Barley and usually Oilseed Rape. Some of what I say will naturally get the “Mandy Rice Davies” response of “He would say that wouldn’t he.” which is fair enough. But I hope to be listened to because I am in the business of producing what the customer wants as demonstrated by market demand.

I would ask you to treat what I write with a certain scepticism, but in doing so, please use that same scepticism when reading the views of others before making up your minds. I will try (and fail in the eyes of some) to be balanced.

As there will be many vegans and vegetarians reading this, I would like to say that I am a great admirer of those who choose vegan and vegetarian diets. They have identified a problem and, rather than shouting about it, have taken a personal action and altered their own diet. Some of the things I say might lower the importance of the climate change reason for following the animal free diet, but there are many other much more valid reasons. I hope no one thinks I am seeking to change their diet.

My principle concern is that you should not be led into an action based on misinformation. That is not wrong information, in fact it is usually correct, but it also misleads. If I can give as an example: you are aware that cows belch methane which is a greenhouse gas more potent than carbon dioxide. I think the figure of twenty-two times as damaging is often mentioned. Nothing wrong with that until you realise that the figure is based on a per kilogram comparison. Then you need to know that Methane is three times lighter than Carbon dioxide, so in any kilogram there are three times more carbon atoms of Methane than carbon atoms in a kilogramme of Carbon dioxide. A truer comparison would be 7.3 times worse, because it is the carbon that causes the damage not the weight.

Now go back to 1500 BC when in Sanskrit Vedic scriptures it was written “Upon this handful of soil our survival depends. Husband it and it will grow our food, our fuel, our shelter and surround us with beauty. Abuse it and soil will collapse and die, taking humanity with it”

We have abused soil over many years. When we moved from being hunter gatherers thousands of years ago, farmers soon realised any plot they cleared and farmed became exhausted after about ten years, and they had to clear another one. In more recent times, we entered the second world war importing 70% of our food and increasing food production became a major priority. Much to their horror, farmers were forced to cash in on years of careful husbandry of soils and grow cereals and vegetables. This went on way into the 1950s and beyond. Skills and infrastructure were lost along with grazing animals and the financial ability to restock.

Farmers have over many years been innovating quietly in all corners of the earth to try to solve the problem. Farmers need to get more carbon back into the soil to increase “organic matter” or carbon in all its forms but principally plants and mini beasts. It is to a degree incidental that this need coincides with the relatively new, and growing concern to reduce atmospheric carbon. Estimates suggest that a teaspoonful of good quality soil contains more living microbes, minibeasts, fungi, and other life forms than, and you will find this unbelievable, there are people on the planet!

I tend to use a story to explain what is happening, largely because there are still so many unknowns. As someone who first studied soils about sixty years ago, I am constantly amazed by how much we have learnt since then, and by how much there is still to learn.

Imagine that you are a little grass seed which has just been dropped by your mother. You have a little stored energy and you know you need to grow because, as is the same for all species, your objective is simply to breed just as you were bred. If you are particularly lucky, you will be near a cow pat for food and in a damp spot for water, so you start to put down a root. Once in the soil you meet a friendly mycorrhizal fungus who, like any good banker, promises to bring you some carbon sugars to help you grow if you can let him have your surplus back with interest when you grow up a bit. You soon put up leaves of bright green chlorophyll and, powered by the sun, photosynthesise and generate more "liquid carbon sugars" than you need, so you repay the friendly fungus. The fungus shares these sugars around to all sorts of plants and microbes who make many things in the soil. Among which is globulin which is a sort of glue which binds the mineral parts of the soil together. This is vital as it gives the soil the structure it needs to allow water to permeate into the soil and be stored there till it is needed by the microbes and plants to grow when there is little rain. A 1% increase in soil Carbon allows soil to store 16,000 gallons more of water per acre. By now you have grown quite big. You decide it is time to grow some seed so that you can ease off and let your leaves dry out and die and stop all this photosynthesis work. Alas, an animal suddenly turns up and eats your leaves; mind you it pees on you as well which is really a benefit, particularly as you now have to produce more leaves if you are ever going to grow any seed and in doing so pump yet more carbon into the soil.

Animals have great importance in the grazing and carbon cycle being an essential tool in the reduction of carbon in the atmosphere as well as for human food. The figure generally quoted as the carbon footprint of a steak is 2.0. This is a world average, but we now know that for UK produced grass fed beef is actually two and a half times less at 0.8. Calculations show that a regime of grass and grazing increases soil carbon, as farmers have known for many years simply by noting the structure of soils below grass compared with other crops and now by measurement of the carbon content. It has been calculated that increasing soil carbon by 0.5% in just 2% of Australia's soil would safely store the country's annual carbon emission. Soil is our major resource and our major carbon store. We must nurture it to survive, just as our plants and animals did billions of years ago only to see the unstable earth burying the vegetation deep underground from where we now extract it as oil, gas, or coal.

Incidentally, only about 40% of winter crops were able to be planted this year due to the wet conditions. 60% of land was left bare, not sequestering carbon, and indeed feeding carbon into the air through oxidation of soil carbon from the bare surface.

Plants, microbes, and green plankton remove carbon from the atmosphere and use it to grow themselves while any surplus is stored in soil or water. More carbon in soils improves structure, increases the water and nutrient holding capacity so increasing plant growth and photosynthesis. It can also reduce flooding and water pollution. Keeping the soil covered at all times, preferably with green vegetation, reduces oxidation and carbon release, stabilises the soil, reduces soil loss and pollution, and, weather permitting, sequesters carbon all year round. No one has yet calculated the net carbon footprint of grazing animals, but it may well be close to, if not below zero.

It is estimated that to feed the world in 30 years' time, we will have to produce in one year as much food as we have produced in the last 1,000 years and in the UK at least 65% of our land is best suited to producing grass. I believe it can be achieved if we use all the tools and resources available from the sun, healthy soils, the laboratory, and human ingenuity.

Robert Campbell, July 2020