



REGENERATIVE FARMING

*Strategies for dirt to soil
and carbon capture*



Aird Farming Group

Strategies for regenerative agriculture



- Inchture, Perthshire
- Stock (Shorthorn, Aberdeen Angus & sheep)
- Arable (wheat, barley, rape)
- 1000 acres heavy soil, flat ground. 700 acres crop, remainder grass.
- Regenerative farming practice (direct drill, cover crops, hedges, organic matter 'dirt to soil')



- Lukestone farm, Renfrewshire
- Stock (Highlanders, Shorthorn & sheep)
- Trees
- Renewables (windmill)



- Badachro, Wester Ross
- Stock (Highlanders)
- Trees (180,000 planted native species)
- Renewables (hydro electric)



AIM

SAME AIM, DIFFERENT STRATEGY FOR
DIFFERENT GROUND

Increase organic matter

- Improve soil quality (dirt to soil)
- Capture carbon
- Absorb and retain water – reduce run-off and erosion
- Improve biodiversity



WE MUST RECTIFY A FAILURE TO LEARN

Today, with modern machinery, we are able to till ground at a rate way beyond anything possible in the past.

If industrial agriculture continues at the current level, we may have only sixty harvests left before we deplete the world's remaining topsoil.



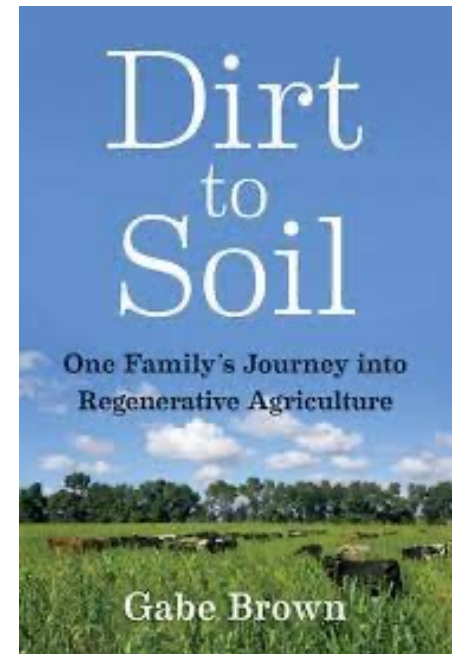
If Industrial agriculture is a major cause of soil erosion & CO2 release,
Regenerative agriculture is a key solution

5 PRINCIPLES OF REGENERATIVE AGRICULTURE

By Gabe Brown 'Dirt to Soil'

They are the same any place in the world where the sun shines and plants grow. The principles are:

1. limit disturbance of the soil
2. keep soil covered with plants at all times
3. strive for diversity
4. maintain a living root system because it feeds the soil biology
5. integrate animals – nature does not function without animals



Principle One. Limit the Disturbance.

The first principle is to limit mechanical, chemical and physical disturbance of the soil.

A move towards “no till” will dramatically reduce the fuel required and prevent the carbon release caused by ploughing.

Sheep grazing winter barley seeded using direct drill at Balgay Farm.



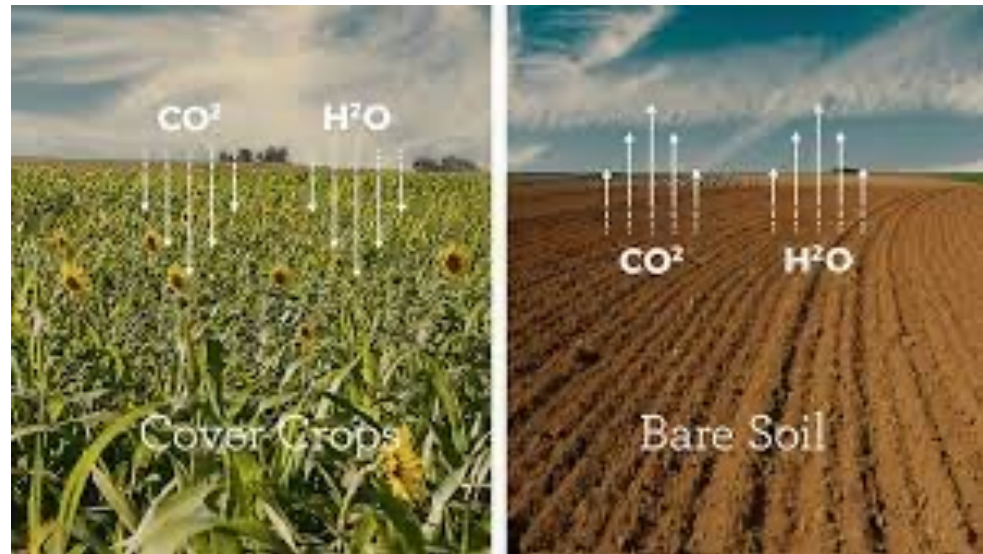
Principle Two. Armour the soil surface.

The second principle is to maintain armour (of plant residues) on the soil surface.

Ploughing in the autumn leaves the land bare to break down. Tilling and seeding in the spring causes soil loss through runoff and starves the fungi and soil bacteria. This removes the underground food supply starving all soil life including earthworms.

What farmer would starve his livestock all winter, why then, during the winter, would you starve your underground livestock.

Bare soil releases carbon whereas covered soil captures it. This is the biggest carbon capture tool at our disposal.



Principle Three. Build diversity.

The more plant diversity in the soil the greater the potential to build organic matter and capture carbon.

Legumes, like clovers, set nitrogen, reducing the requirement for chemical fertilisers.

Chicory, plantain and red clovers are all deep rooted and with grasses the soil now feeds on root exudates of many plants. Think of the amount of carbon cycled due to all these living plants.

Multi-species herbal lay at Killochries Fold, Lukestone Farm



Principle Four. Keep living roots in the soil.

The fourth principle is to maintain living roots in the soil as long as possible throughout the year.

Leaving the ground bare throughout the winter starves the “underground livestock” and promotes erosion and runoff.



Principle Five.

Integrate animals.

Different management practices for different ground (multi-species/trees/grass/etc).

STOCK IS KEY.

What difference does it make?

- The answer is that this is the way the tens of millions of bison, elk, deer and other ruminants created the great grasslands of the world.
- Worldwide, it has been the movement away from mixed farms to the development of industrial farming that has caused the most damage.
- For every 1% we can increase organic matter in our soil we will capture 10 tons of carbon per acre and retain twenty five thousand gallons of water per acre.





SHEEP GRAZING WINTER
BARLEY, SEEDED USING
DIRECT DRILL AT
BALGAY FARM



MULTI SPECIES
HERBAL LAY AT
BALGAY FARM



ORGANIC MATTER AND CARBON CAPTURE

Drumcross Farm, Bishopton

At purchase in 2008, Organic matter was less than 3%. Now, being in permanent grass, grazed by the cattle, the soil tests this year revealed the average across the farm is in excess of 9%.

This equates to an improvement of 6% X 180 acres X 10 tons of carbon @ 1% = 10,800 tons of carbon captured on this small farm.

Killochries Fold and Lukeston Farm

Cattle and sheep have always been run here. Today organic matter is in the high teens, with some fields over 20%.

KILLOCHRIES COWS AND CALVES ON MULTI-SPECIES GRASS LAY

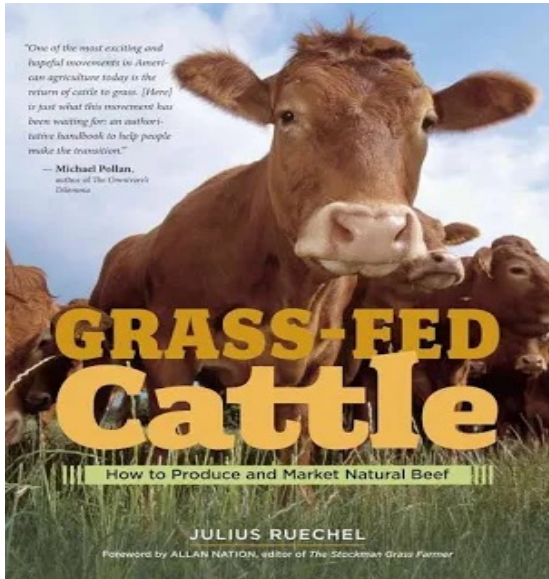


Here our livestock eat grass and drink water from natural sources. They are clearly carbon negative and create a high-quality food source that supports and improves biodiversity.



BIODIVERSITY

- Each Killochries hill cow produces 25% of her bodyweight in invertebrate life each season.
- The average weight of our Highlanders is over 500Kg, so each season every cow produces 125Kg of invertebrate life - feeding soil life, mammals and birds, right up to the birds of prey.



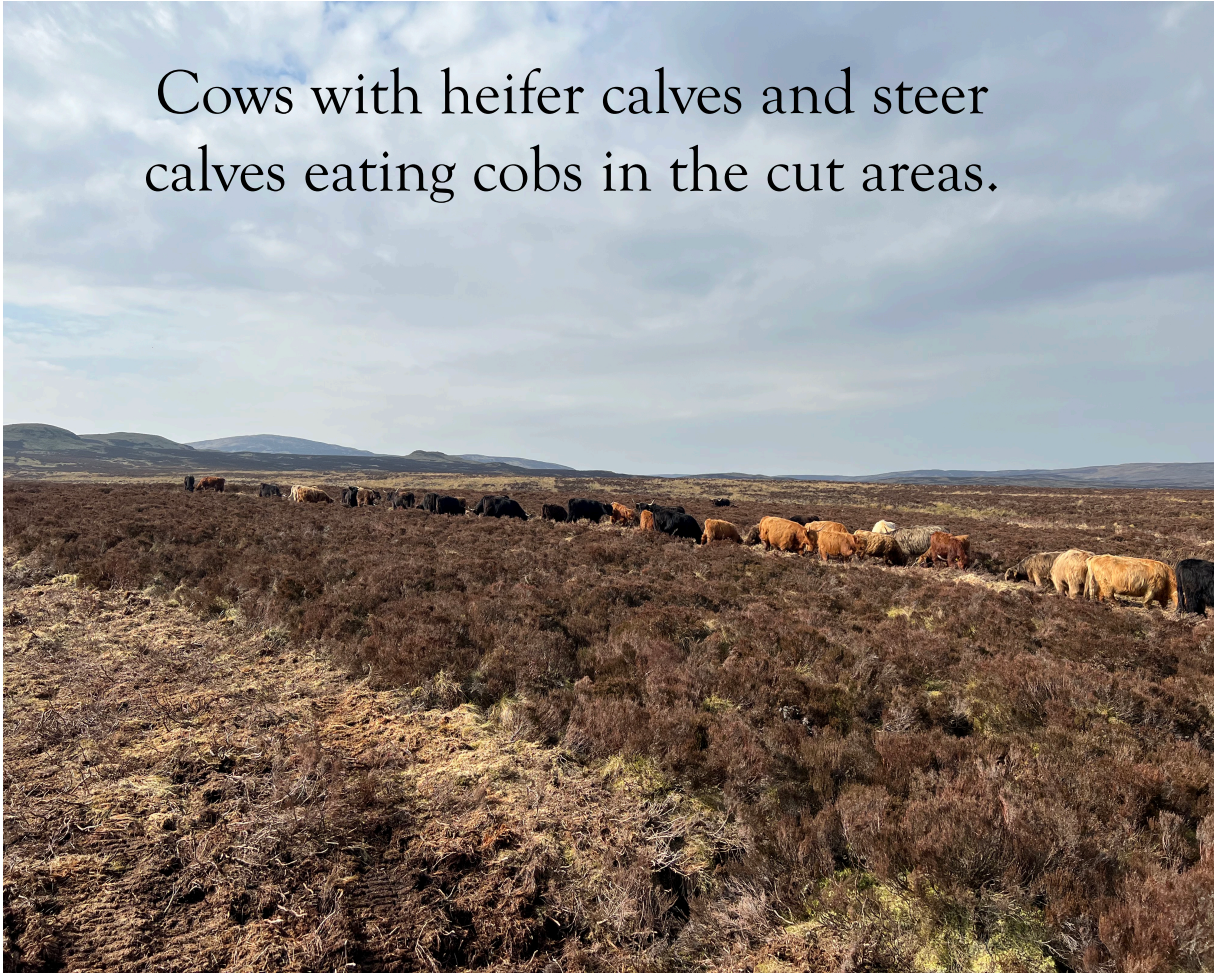
JULIUS RUECHEL'S 'GRASS-FED CATTLE' HAS BEEN AN INSPIRATION

- When do the local prey animals calve (deer).
- Time your calving to this natural cycle. Late spring, early summer.
- This is the best time for her to face the stress of labour.
- She has recovered her body condition after the winter.
- Her colostrum will be peak condition.
- Reduces calving difficulty calving on fresh grass.
- She should conceive within eighty-five days of calving.

CALVES WITH THEIR MOTHERS WINTERING ON THE MOOR,
FED ON AREAS OF RANK HEATHER



Cows with heifer calves and steer calves eating cobs in the cut areas.



The moor after regeneration



The calves in the main group on the moor were the heifers and the steers.



Low impact Softrak with mounted cob feeder



Softrak cutting rank heather

People Involved

- Ian Duff – Tenant farmer of the Moor, Hardridge Farm.
- Scottish Agriculture College.
- Nature Scotland.



BULL CALVES

The bull calves all had a high DNA score. They were wintered with their mothers and supplemented with hay as they were on the lower ground without the roughage of the moor.

All male calves with a lower DNA were castrated.



ADVANTAGES OF DIRT TO SOIL & BIODIVERSITY

- Remove purple moor grass and other poor quality forage
- Increase organic soil matter and allow germination of heather seed
- Better water retention, less run-off, better water quality
- Dung provides year-round food for life cycle
- Spring grasses greener with better diversity
- Wildfire risk reduced
- Requirement for muir burning reduced

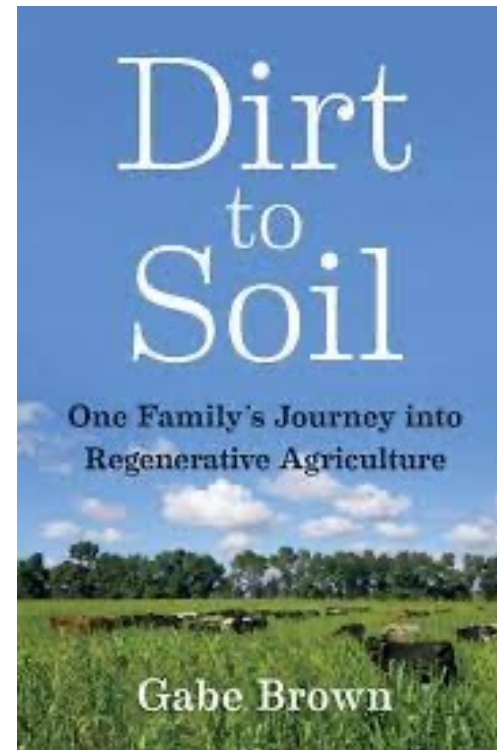
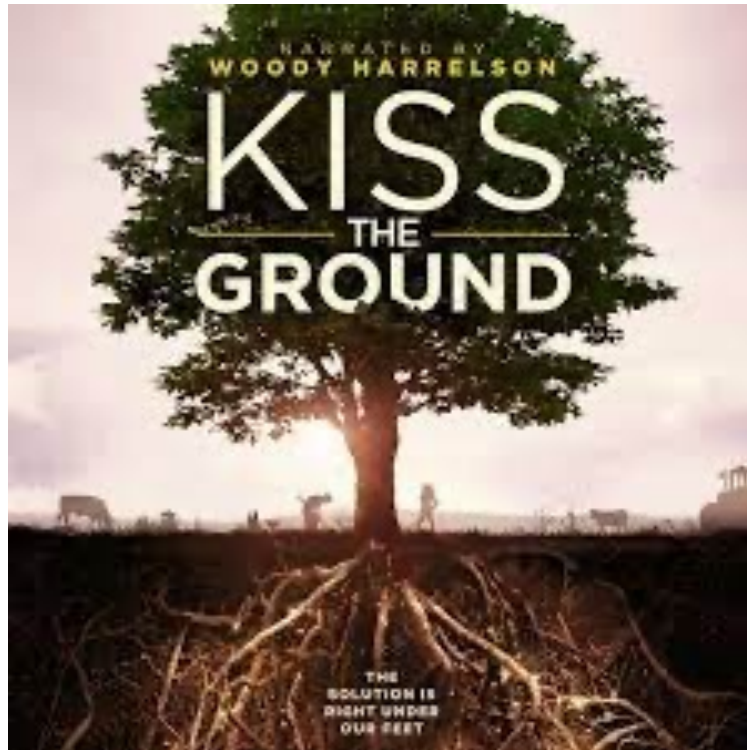
Note: Rotate feeding areas to allow rest and regeneration.



In Summary

- Cows on the moor October.
- No cow lost more than two points condition score.
- Health was excellent.
- Calves were weaned when new grass arrived.
- First calf born 23rd April.
- Last calf born 26th June.

SOME RESOURCES I HAVE FOUND HELPFUL



Thank you for joining us at
Lukeston!