Improving biodiversity, reducing emissions and helping farm businesses

Practical actions farmers can put in place in a changing climate

Rebecca Audsley, Iain Boyd and Mary-Jane Lawrie (SAC Consulting)
Tuesday 24th September 2019

SAC Consulting is a division of SRUC

Leading the way in Agriculture and Rural Research, Education and Consulting

Presentation outline

- Challenges for farmers in terms of climate change and other environmental issues
- Highlight some of the positive environmental actions seen via the Farming for a Better Climate focus farmer network
- Examples from other work
- New publications

Welcome to the farming, biodiversity and climate change challenge…

Increased weather variability and more weather extremes

Wetter, warmer winters

Hotter, drier summers

New pests and diseases; spread of invasives

Current and future markets and mixed messages – food and environmental protection

Emissions; how to achieve net-zero by 2045. Issue and solution?

A bit of background…

Farming for a Better Climate

- Scottish Government funded targeted communication strategy
- Encourage adoption of practical mitigation measures
- Improve business performance/efficiency
- Help farmers to adapt to climate change

NEW Soil Regenerative Agric Group

- Five farmers working together to improve farm soil resilience
- Current topics include
  - Cover and companion cropping
  - Transition to reduced tillage
  - Soil foodwebs/biological health
  - Reduced use of chemicals and fertilisers

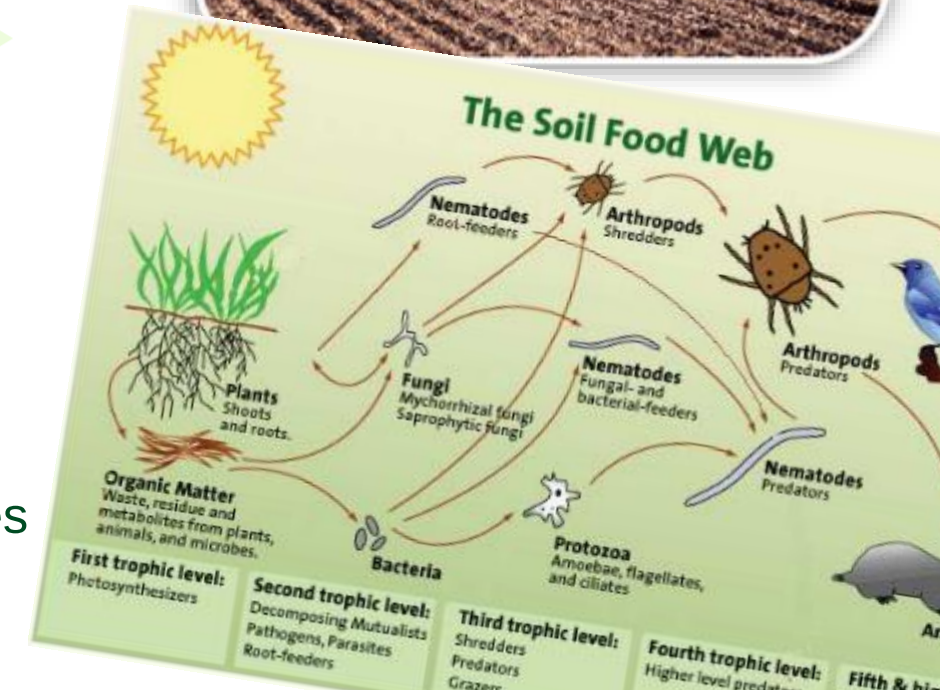


FFBC – primarily emissions reduction…

…so what have the focus farmers, their discussion groups and Soil Regenerative Agric group done or currently doing that is of benefit to biodiversity?

Move towards ‘Conservation agriculture’

- Various methods around no or reduced plough.
- No or minimum soil disturbance (no till seeding and weeding).
- Maintenance of permanent soil mulch covers (crop residues, cover crops).
- Cropping system diversity (crop rotations, associated cropping).
- Minimising soil disturbance protects soil organic matter and soil biodiversity.
- Increased soil life brings other species back to the farm

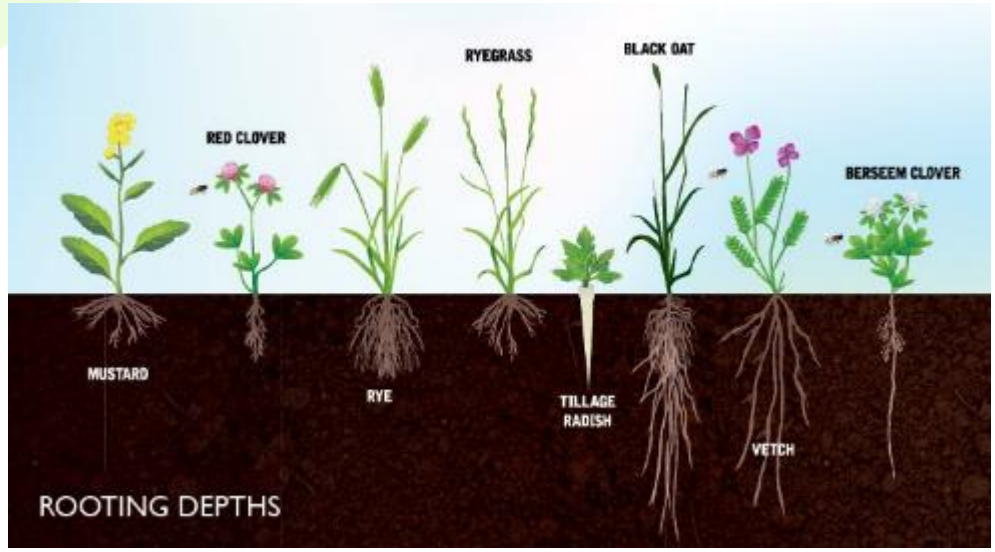


How to gauge soil biodiversity?

- Laboratory tests on soil samples to estimate biological activity
- Bait Lamina sticks
- Worms
- Visual assessment of organic activity over time

Use of cover crops

- Bare soils at risk from erosion
- Cover crops tried by a number of the focus farms
- Choice and mixture give different benefits to farm soils
- Bespoke pollinator mixes



Pic - www.agrovista.co.uk/cover-crops/151

Soil Regen Agric Group – seeking added benefits from soil improvements

- Looking at fungi and bacterial components in soil
- How to improve conditions for ‘good’ soil bacteria and fungi
- Support crop resilience and strengthen food web
- Improved natural crop resilience could mean less reliance on herbicides

Increase carbon sequestration on the farm

- Manage existing farm woodland and hedgerows
- Encourage new planting; many different motivators
  - Shelterbelts
  - Biosecurity
  - Amenity
  - Woodfuel
  - Legacy
- Doesn’t have to be vast, commercial planting
- Agroforestry?

Inclusion of clover in grass swards

- Provide leys with a continual supply of nitrogen
- Over-seeded clover into grassland fields
- Clover allowed reduced nitrogen applications (2,388kg in Yr1 then 3,000kg in Yr2)
- With value of £0.66/kg N saved:
  - £3,556
  - 71,173 kg CO_2e
- Reduced N applications, increased sward diversity and provided food source for pollinators

Better use of fertilisers, sprays and chemicals

- Keeping set buffers (primarily an efficiency measure)
- Keeps sprays, fertilisers and chemicals out of watercourses
- For example min 6m around watercourses at focus farm Castlemains; extend for slurry and manures

Buffer strips; protecting water quality

- Intercept run off
- Could be as a result of soil erosion or slurry application to land
- Fenced buffers or alternative drinking options keep or restrict livestock access, reducing poaching risk and allow regrowth
- Protect water quality from nutrients and sedimentation
- Additional planting for shelter or shade?

Photos – Lucy Filby; SEPA

Managing water around the steading

- SUDS System to deal with lightly contaminated water at the farm steading
- Creation of bespoke new ponds, swales, constructed farm wetlands
- Introduce new habitats to the farm
- Working with nature rather than a hard engineering solution

NEW Publication - ‘Greening’ around the steading

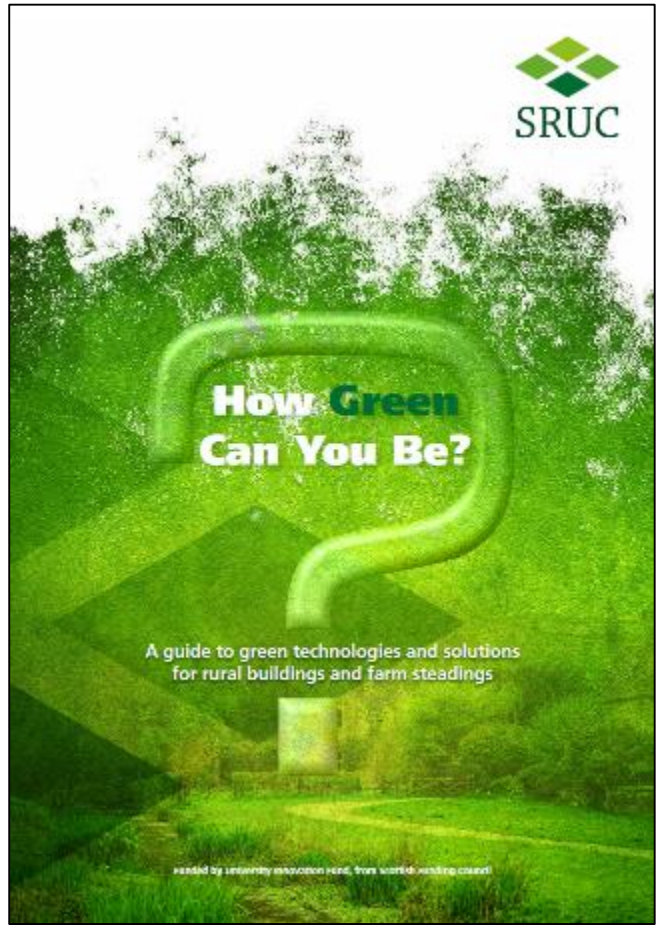
- Greening rural buildings and infrastructure provides a mix of environmental, economic and engineering benefits.

- Building design
  - Green roofs
  - Siting, Orientation and Passive Solar Design
  - Added insulation

- Renewable Energy
  - Air and Ground source heat pumps, biomass, solar pv and thermal
  - Energy metering and fuels

- Drainage (blue)

‘the process of becoming more active about protecting the environment’

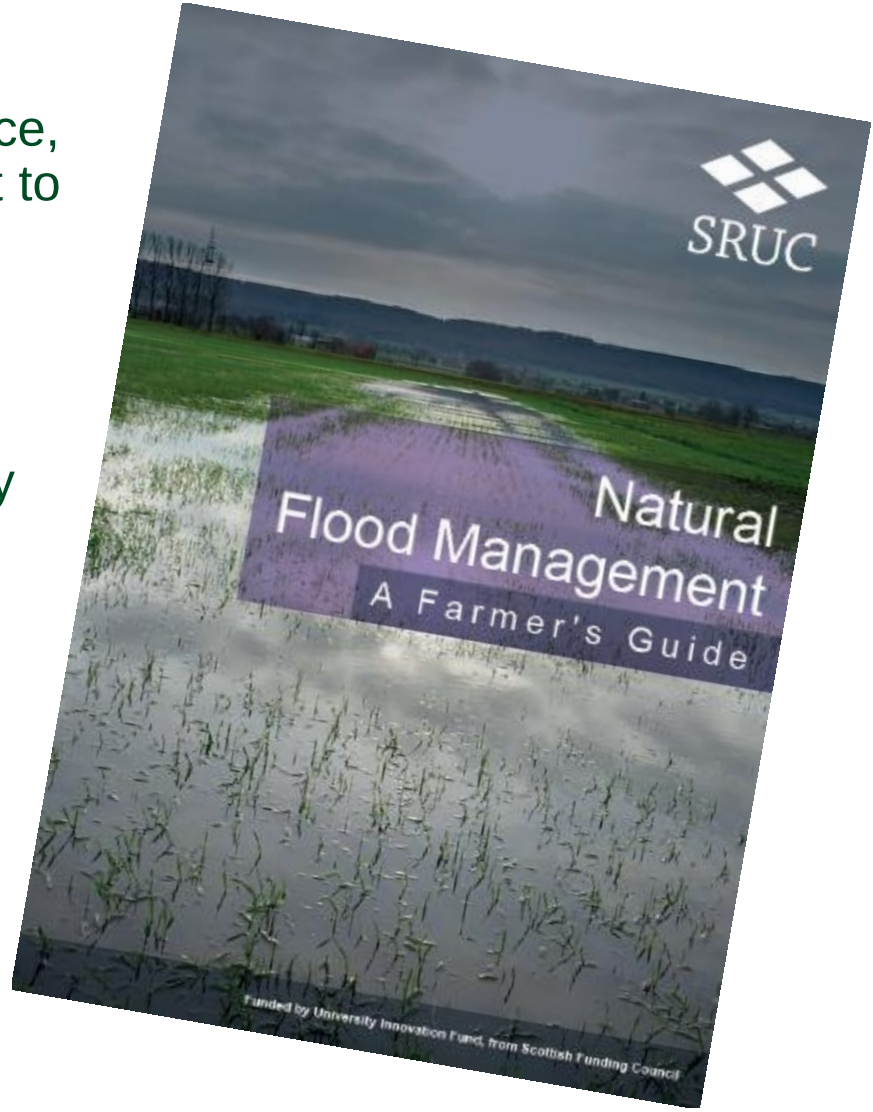


NEW publication - NFM

- Natural Flood Management (NFM) is a process whereby systems are put in place, which work with the natural environment to store and slow down the flow of water running through the catchment.

- Schemes on farmland can help reduce catchment flooding, increase biodiversity and reduce diffuse pollution.

- Small to large scale methods including:
  - Riparian planting
  - Soil management
  - Wetland creation
  - Offline storage
  - Re-meandering



Summary

- Tweak what you have to include measures for biodiversity; small measures could be cumulative
- More farmers taking note of farm soils and the wider benefits from improved soil health
- Need to enhance measures that benefit the farm business and contribute to environmental gains
- Farmers and land managers are asked to achieve multiple objectives
- Farmers can be part of the solution; sequestering carbon and enhancing biodiversity

Thank you.

rebecca.audsley@sac.co.uk

Find us on Facebook

Follow us on Twitter: SACfarm4climate

Visit: www.farmingforabetterclimate.org

Email: climatechange@sac.co.uk

Funded by The Scottish Government