FARMING FUTURES

FACT SHEET 4

Climate change series

General ways to mitigate climate change

Farmers can play a part in reducing climate change. Farmers are well known for rising to a challenge and coping when the going gets tough, but it is possible to reduce the severity of the impacts of climate change by taking some of the steps outlined on this fact sheet. These ideas will help improve the situation nationally and globally by reducing the release of greenhouse gases (GHGs).

Start by undertaking a greenhouse gas emission audit on-farm using a carbon calculator such as CALM. This will give the farm's carbon footprint and help identify where emissions and costs can be reduced.

The key GHGs to reduce are methane, nitrous oxide and carbon dioxide.

Reduce methane emissions

Methane has around 20 times the greenhouse effect of carbon dioxide and is released by natural livestock emissions and manure.

- Check livestock are fed an optimal diet. Some studies suggest an increase in concentrates and maize silage fed to cows reduces methane. This may improve feed efficiency but could increase carbon dioxide emissions
- Investigate installing an anaerobic digestion plant. Known as AD, it can help reduce methane emissions (and also offsets carbon emissions when linked to electricity and heat generation). AD involves harnessing gas released from rotting waste in a controlled environment without oxygen. The gas released (known as biogas) is a mixture of methane and carbon dioxide and can be used as a fuel source for heating and/or electricity production. The by-product (known as digestate) can also provide a valuable fertiliser. AD plants work best when inputs of liquid manure are combined with other organic wastes, energy crops or wood waste

Reduce nitrous oxide emissions

Nitrous oxide has around 310 times the greenhouse effect of carbon dioxide and is released from the production and use of fertiliser (including from muck-spreading) and soil disturbance. See fact sheet 21 on nutrient management for further information.

- Optimising fertiliser efficiency saves emissions and money. Although much of this is covered by assurance schemes and NVZ regulations, better accounting and integration of nitrogen applied to land can reduce GHG emissions
- Investigate using manures and slurries more effectively
- Apply fertiliser on damp days to increase absorption and reduce evaporation, taking care to avoid diffuse water pollution issues
- Reduce rainfall mixing with manures by covering stores
- Cover slurry and manure lagoons if possible
- Increase nitrogen uptake by crops by using nitrogen efficient crop varieties
- Use the latest application technology on farm where appropriate – for example GPS mapping for larger farms
- Include nitrogen fixing crops in rotations and as cover crops (e.g. legumes, red clover, vetch, rye or cocksfoot)
- Precision farming techniques allow nitrogen to be targeted more effectively

Reduce carbon dioxide emissions

Carbon dioxide is released by burning fossil fuels (e.g. fuel in tractors, farm vehicles, machinery and the production of agricultural chemicals) and during changes in land use and land management.

1) Preserve carbon sinks

- Maintain forests/areas of vegetation which naturally absorb carbon dioxide and preserve the ability of the soil to store carbon
- Store (sequester) carbon in soils by using min-till to cultivate soils
- Grow crops which can be used for liquid biofuels (such as oil seed rape) or biomass crops

(such as *Miscanthus* or coppice willow) to supply other sectors with an alternative to fossil fuels

- Build up organic matter in soils by adding compost and reducing tillage
- Try to reduce soil erosion by avoiding cultivating wet soil, leaving soil covered over in winter, increasing organic matter by adding crop residues and manures and leaving buffer strips and hedges as protective barriers if appropriate
- Investigate the possibility of entering some land into carbon trading/storage systems. The first voluntary schemes are being set up. These allow farmers to enter into 5-10 year agreements where grassland or woodland can be left as carbon stores. This may become more profitable in future years, as the market 'price' of carbon increases

2) Be energy efficient and cut energy costs

General

- Use the Energy Saving Trust and Carbon Trust guides to energy efficiency
- Establish an energy action plan
- Speak to the Carbon Trust about a free energy audit, or NFU members can contact the NFU energy service
- Monitor energy use so problems or unexpected changes can be identified
- Try to involve staff in energy saving measures, download this poster pack for offices and farm buildings
- Out-winter livestock where appropriate but note that whilst winters may be milder, wetter weather may cause erosion problems

Electricity/heating/cooling

- Check all equipment is switched off properly (i.e. not on stand-by) when not in use
- Consider using timers for optimum energy control
- When replacing equipment, look for the most energy efficient 'A' or 'AA' rated appliances and ask suppliers to stock these
- Ensure thermostats and controllers are set at the most appropriate level
- Check and optimise insulation levels and add more if possible to keep heat in and out
- Keep all equipment clean to work at its optimal level
- Consider joining the Climate Change Levy Rebate Scheme (for pig, poultry or horticulture producers). This scheme enables producers to claim a rebate in return for meeting energy saving targets

Renewable energy

- Consider biomass heating or electricity
- Consider geothermal heating
- Look into biomass production on farm. Conventional crops can be grown for biodiesel, or investigate contracts available for *Miscanthus* or willow production on farm. Installation of biomass boilers for new systems can reduce GHG emissions and reduce costs. It may also be possible to supply the local community or power station. Combining heat production from a biomass boiler with electricity production may further add to the environmental and economic incentives
- Consider producing your own on farm renewable energy

Transport

- Try to reduce transport needs by being more efficient with journeys
- Carry out regular checks on all tyre pressures to ensure that farm vehicles, tractors and machinery are working to their optimum efficiency and maximise fuel usage
- Ensure that any boilers are maintained and serviced regularly.
- Look into new low-carbon transport fuels for on-farm machinery (e.g. biodiesel). Biofuels can reduce GHG emissions by over 50% when compared to fossil fuels

FARMING FUTURES

For news, events, and links to stories about how other farmers are managing climate change on their farms, please visit: www.farmingfutures.org.uk

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