

## FOOD CHOICES AND CLIMATE CHANGE

This information sheet explores the options farmers and consumers have to help reduce global warming.

Agriculture is a large contributor to climate change. Worldwide it generated over 20% of greenhouse gas emissions in 2001<sup>1</sup>. Aotearoa-New Zealand is a country heavily dependent on agriculture and as a result, the percentage of emissions is higher (49% in 2004)<sup>2</sup>. But could agriculture become a way of mitigating climate change?

Greenhouse gas emissions from agriculture are almost exclusively generated by the release of carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>) and nitrous oxide (N<sub>2</sub>O).

### Total greenhouse gas emissions by sector – 2001 (tonnes/year)

<b>North Island</b>	<b>CO<sub>2</sub></b>	<b>CH<sub>4</sub></b>	<b>N<sub>2</sub>O</b>	<b>HFCs</b>	<b>PFCs</b>	<b>SF<sub>6</sub></b>
<b>Agricultural</b>	442,529	16,418,000	7,443,303	0	0	0
<b>Area</b>	2,443,443	2,074,287	96,614	590,695	0	0
<b>Industrial</b>	19,205,805	584,897	113,303	112,181	0	11,802
<b>Natural</b>	1,142,378	174,304	20,346,590	0	0	0
<b>Transport</b>	10,176,333	51,310	81,605	0	0	0
<b>South Island</b>	<b>CO<sub>2</sub></b>	<b>CH<sub>4</sub></b>	<b>N<sub>2</sub>O</b>	<b>HFCs</b>	<b>PFCs</b>	<b>SF<sub>6</sub></b>
<b>Agricultural</b>	414,869	9,541,977	4,374,923	0	0	0
<b>Area</b>	1,336,251	715,726	34,704	189,305	0	0
<b>Industrial</b>	2,515,499	565,457	23,858	36,669	56,550	3,858
<b>Natural</b>	1,531	33,936	13,008,238	0	0	0
<b>Transport</b>	3,376,780	16,812	27,905	0	0	0
	<b>CO<sub>2</sub></b>	<b>CH<sub>4</sub></b>	<b>N<sub>2</sub>O</b>	<b>HFCs</b>	<b>PFCs</b>	<b>SF<sub>6</sub></b>
<b>NZ Total Emissions</b>	41,055,418	30,176,706	45,551,043	928,850	56,550	15,660

Estimates are reported in units of CO<sub>2</sub> equivalents (tonnes).<sup>3</sup>

### Carbon dioxide (CO<sub>2</sub>)

Agriculture is responsible for one third of carbon dioxide emissions worldwide. It is generated by clearing forests; turning natural vegetation into cultivated land; the intensification of agriculture and transporting food.

In New Zealand the situation is different. The agricultural sector accounts for only 2% of carbon dioxide emissions because it is offset by tree-planting by the

<sup>1</sup> *Organic Agriculture, Environment and Food Security*, ed. N. El-Hage Scialabba and C. Hattam, FAO, 2002

<sup>2</sup> NZ Greenhouse Gas Inventory 1990 – 2004, Ministry for the Environment, April 2006

<sup>3</sup> Inventory of New Zealand Greenhouse Gas Emissions - 2001, NIWA

forestry industry, which acts as a carbon sink. This is one good example of the agricultural sector mitigating climate change.

Is organic farming a better option? A 1994 study calculated the carbon dioxide emissions of German organic farms to be .5 tonnes per hectare, whereas in conventional agriculture the amount was 1.3 tonnes, a difference of 60%.<sup>4</sup> In organic agriculture, emissions are mainly caused by fuel consumption, whereas in conventional agriculture the majority of emissions are from nitrogen fertilisers, feedstuffs and fuel.

The Rodale Institute has been running trials comparing organic and conventional farming in the US for the last 23 years. US agriculture currently emits a total of 1.5 trillion pounds of carbon dioxide into the atmosphere. The Rodale Institute trials show that 'converting all US cropland to organic would not only wipe out agriculture's massive emission problem, (but) by eliminating energy-costly chemical fertilisers, it would actually give a net increase in soil carbon of 734 billion pounds.<sup>5</sup>

The regular addition of organic materials to the soil is the only way to maintain and increase soil organic carbon (ie carbon absorbed by the soil) and this is the basis of organic agriculture. Conservation tillage combines minimum tillage with fertilisers and herbicides and has been promoted by conventional agriculture as the way to absorb carbon dioxide. But the gains in soil organic carbon from this method are likely to be negated by the increased nitrous oxide emissions from the fertilisers.

The agricultural emission figures do not take into account the transport of food. Transport accounted for 33% of this country's carbon dioxide emissions in 2001, but it is not clear how much of this involved the transport of food. A UK study in 2005 reported that 28% of road freight is food or produce<sup>6</sup>. While there is no inherent difference in organic and conventional produce in this respect, Commonsense Organics stresses the importance of seasonal produce by providing a calendar of fruit and vegetables in season, to help customers develop the habit and skills of eating food in season. We also have a policy of supporting local growers to reduce the need for long haul transport.

### ***Consumer choices to minimise carbon dioxide emissions***

#### ***1. Buy local, seasonal food***

Buying local food reduces the need for long haul transport. Many areas in New Zealand now have farmers' markets, but it is important to be aware that not all

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<sup>4</sup> Haas and Kopke, 1994, quoted in *Organic Agriculture, Environment and Food Security*, ed. N. El-Hage Scialabba and C. Hattam, FAO, 2002

<sup>5</sup> Rodale Institute website; [http://www.newfarm.org/depts/NFfield\\_trials/1003/carbonsequest.shtml](http://www.newfarm.org/depts/NFfield_trials/1003/carbonsequest.shtml)

<sup>6</sup> J. Pretty & T. Lang, *Buy local produce and save the world*, Food Policy Journal, UK, February 2005

stalls sell only their own produce. This is particularly the case in cities. Ask where produce comes from.

## 2. *Buy organic food*

As shown above, organic agriculture reduces carbon dioxide emissions. The challenge now is to turn this reduction into a net increase in carbon in the soil.

## **Methane (CH<sub>4</sub>)**

The vast majority (97.6%) of methane emissions in New Zealand are caused by ruminating animals (mainly cattle and sheep).<sup>7</sup> Since methane has 21 times the impact on global warming compared with carbon dioxide, it represents the biggest challenge for New Zealand agriculture and this applies to both organic and conventional systems. Methane accounts for 70% of our total agricultural greenhouse gas emissions and 31% of our total emissions from all sectors.<sup>8</sup>

### ***Consumer choices to minimise methane emissions***

#### 1. *Eat less meat*

The most effective action that individuals can take is to eat less meat. If you eat meat every day, consider introducing a vegetarian meal once a week and try to increase that as you get used to different menus.

#### 2. *Lobby for a tax on methane*

The government did try to introduce a tax on methane and this attempt was subverted by opposition parties (with the exception of the Greens) ridiculing the idea as a 'fart tax'. But there was little attempt by the government to educate the population on why such a tax was needed.

## **Nitrous Oxide (N<sub>2</sub>O)**

Nitrous oxide is 310 times as potent as carbon dioxide in terms of global warming and agriculture contributes to 65%-80% of total nitrous oxide emissions. This is mainly due to the use of nitrogenous fertilisers and animal waste. In Aotearoa-New Zealand significant contributors to direct soil emissions are from synthetic fertilisers, animal waste applied to soils, crop residues and cultivation of soils. Indirect N<sub>2</sub>O emissions are caused by the amount of nitrogen from synthetic fertiliser and animal excretion that volatilises into the atmosphere as N<sub>2</sub>O.<sup>9</sup>

Organic methods minimise the emissions of nitrous oxide, because:

- No synthetic nitrogen fertiliser is used, and this limits the total nitrogen level and reduces emissions caused during the energy demanding process of fertiliser synthesis;
- Agricultural production in tight nutrient cycles aims to minimise losses;

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<sup>7</sup> New Zealand Climate Change Office, Ministry for Environment, (2003) New Zealand national inventory report (NZNIR), Greenhouse gas inventory 1990 - 2001

<sup>8</sup> NZ Climate Change Office website, <http://www.climatechange.govt.nz/sectors/agriculture/index.html>

<sup>9</sup> Inventory of New Zealand Greenhouse Gas Emissions - 2001, NIWA

- Animal stocking rates are limited, thus excessive production and application of animal manure is avoided;
- Diets of dairy animals are lower in protein and higher in fibre, resulting in lower emission values.<sup>10</sup>

***Consumer choices to minimise nitrous oxide emissions***

1. Buy organic food
2. Eat less meat

This information sheet only looks at the issue of food choices and climate change. If the focus is broadened to wider issues of sustainability – the problems of soil degradation, water quality, biodiversity, and nutritional value, then organic agriculture is clearly the most sustainable and nutritious option.

At Commonsense Organics we are future-oriented and take a holistic view of sustainability. Our trading philosophy states:

Our business exists to provide customers with delicious, nutritious and safe food and other products based on business principles that enhance the environment and everyone in our wider community.

We are committed to:

**organically grown food** which promotes good health and the long term care of our environment;

**environmental sustainability** which preserves the earth’s resources for future generations and species

**fair trade and social responsibility** acknowledging that our business is interdependent with our staff, our local community, Aotearoa-New Zealand and the rest of the world

It’s just common sense.

Marion Wood  
January 2007

<sup>10</sup> Kotschi J & Muller-Samann K (2004): The Role of Organic Agriculture in Mitigating Climate Change, International Federation of Organic Agriculture Movements (IFOAM)