

The Heat Is On

Sustainable agriculture is being promoted for a multitude of reasons: economics, confidence in food quality, pesticide concerns and declining numbers of family farms, to name a few. However, much of the focus has been on soil and water degradation: soil erosion, soil compaction, phosphorus run-off in surface water and nitrates in ground water. This emphasis may change in the 1990's. The result of what is done on Canadian farms affects the air that we all must breathe and may be contributing to a global change in climate.

There is no longer a debate about whether or not a greenhouse effect exists. Carbon dioxide (CO₂) concentrations in the atmosphere have increased from 280 ppm before the industrial revolution to 350 ppm today. There is considerable debate about how great the effect will become, how fast it will occur and how dramatic the consequences will be for agriculture. According to most climate models, the continued buildup of CO₂ and other infrared absorbing greenhouse trace gases is likely to lead to surface air temperature rises of 1.5 - 5.5° C and changes in precipitation patterns over the next 50-75 years. It is worth mentioning that this is within our lifetime, or at least that of our children.

However, most experts predict changes in the next 10-20 years. While a handful of corn farmers in PEI may be delighted to hear that things are warming up, there is major concern for the prairie farming region. What is particularly disturbing is how successful humans have been in the deforestation of the planet and creating man-made deserts without assistance from the greenhouse effect to date. Responding to the additional challenge of global warming may be overwhelming if societies wait for the final details on this phenomenon before taking action. Even if the greenhouse effect has little effect on global warming, many of the things that need to be done to reduce carbon loading make sense for other economic and environmental reasons.

From an agricultural perspective, two processes are involved in improving this atmospheric problem. The quantity of CO₂ in the atmosphere can be reduced by cutting down on energy needs in agriculture. Secondly, farmers can improve air quality by turning the agricultural landscape into an absorbing sponge for CO₂. In fact, agriculture could provide a leadership role for the rest of society in coming to terms with the global warming problem.

Farming can have positive impacts on carbon loading if more sustainable agricultural methods are adopted. Most carbon loss from agriculture comes from over-tillage (loss of organic matter) and the waste products of nitrogen fertilizer production. When it is said that prairie soils have lost 50 % of the organic matter that they once had, does not mean it has entirely disappeared; the organic matter has been lost to the atmosphere.

Systems of crop production need to be developed so that crops can be produced with a great deal less non-renewable energy. The by-product of fossil fuel consumption is CO₂. For example, corn is a high consumer of carbon from the atmosphere but this positive effect is negated by extensive carbon emissions from the impact of the use of large quantities of nitrogen fertilizer, herbicides, and propane for crop drying.

More positive effects on reducing CO₂ in the air can be achieved through practices which contribute to organic matter accumulation, particularly through the use of cover crops and perennial forages. Trees are also an important carbon absorber which can form an integral part of a sustainable farm in the form of shelterbelts and well managed woodlots. As Henry Kock states in his article on page 18, planned plantings of trees also provide an excellent means of reducing the drying effects of winds on the soil.

Farmers such as Doug Smith of Thamesville, Ontario are the mentors in developing sustainable change at the farm level. Practices such as switching to a planned crop rotation from monoculture corn, adopting ridge tillage, band applying herbicides and testing new cover crops such as hairy vetch can make major strides in reducing energy consumption while increasing farm income. The real advantage of these practices is that they don't just reduce carbon loading but positively effect all the other areas that need enhancement when developing sustainable farming techniques.

Agriculture has been taking a lot of heat from the rest of society over subsidies and resource degrading farming practices. It needs relief. The issue of global warming may provide the impetus needed to develop a truly sustainable agriculture in a society desperate for leadership and direction.

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