

Impact of Climate Change and Sustainability Issues on the New Zealand Turf Industry

BACKGROUND

Within the foreseeable future the way in which turf is managed will inevitably be required to change. The two driving forces for this change will include:

- Climate change associated with global warming.
- Sustainability issues.

As a signatory to the Kyoto agreement, New Zealand is required to reduce its CO₂ emissions to pre-1990 levels. The government's commitment to this was reinforced in a recent address (16th February) where it was stated:

*"NZ was to become the first sustainable country (ie carbon neutral)
Public service will become carbon neutral by 2012".*

Whatever your personal views towards climate change, this commitment is an indication that industries including the turf industry will need to voluntarily adopt more environmentally friendly practises and/or face legislation and the inevitable increase in costs this will impose.

CLIMATE CHANGE

Climate change or Global warming is the gradual increase in temperature, primarily brought about by the accumulation of carbon dioxide, methane and nitrous oxide within the atmosphere.

NIWA is forecasting that New Zealand can expect the following changes to their climate as a result of climate change:

- Gradual increase in temperature (approximately 0.2 – 0.6°C every 10 years).
- Reduced diurnal variation in temperature.
- Increased risk and frequency of droughts, particularly on the east coast of New Zealand. Furthermore, drought is expected to occur at different times of the year namely; autumn, spring and summer.
- Increased occurrence of heavy rainfall events.

- Increase in the frequency and strength of the wind.
- A gradual increase in the sea level.

The long term impacts of climate change on the management of turf are largely unknown. However where NIWA's forecasted changes do occur, management changes may include:

- Survival of existing grass types is unlikely to be an issue. However there may be greater opportunity/demand for growing warm season grasses such as Cynodon within New Zealand. Similarly, tropical grass weeds such as summer grasses and Paspalum can be expected to occur further south.
For example; Summer grass (Digitaria species) has now been found as far south as Balclutha.
- Increasing temperatures and reduced diurnal variation will likely contribute to greater incidence and severity of disease. Furthermore, the occurrence of diseases such as Brown patch, Pythium etc. can be expected to occur further south.
For example: For the first time, Dollar spot was identified as far south as Dunedin, whilst Rolf's disease was identified attacking greens/surrounds on the East Coast.
- Incidence and severity of some pests such as nematodes may increase.
- Erosion is likely to be of greater concern for turf facilities located in close proximity to the coast.
- It is likely that floods will occur more frequently and potentially be more severe, affecting our low-lying facilities.
- Compliance requirements (Resource Management Act, District Plans) will impact on how the turf facility is managed.
For example: Burning of vegetation is now banned in Motueka, whilst in other areas of New Zealand the future availability of water for irrigation has been called into question.
- Maintenance costs will inevitably increase, in order to meet the anticipated new compliance requirements.
- For many turf facilities, there is the possibility of identifying and establishing "carbon sinks" (ie areas that will absorb CO₂).
- Other??

SUSTAINABILITY ISSUES

Sustainability requires an industry to work in harmony with nature such that an ecological balance is maintained and that natural resources are not depleted.

Potentially, sustainability will have the greatest impact on our turf industry, through:

- Legislation (e.g. proposed tax on nitrogen fertiliser, Resource Management Act).
- Availability of key resources such as:
 - Sand (increasingly, suitable sands are becoming scarcer in some areas of New Zealand).
 - Topsoil and cricket clays (are increasingly becoming more difficult to source).
 - Water (several NZ Regional Councils have indicated that water will need to be managed better, as a greater demand for this resource occurs).
 - Pesticides (many commonly used pesticides such as chlorothalonil, chlorpyrifos,

- clopyralid, endosulfan, etc) are presently having their classification reviewed.
- Oil and other fuels.

In order for the turf industry to adapt and meet the challenges imposed by Climate change and Sustainability:

- ❑ A greater emphasis on strategic or long term planning will be required to ensure that proposed developments are in fact sustainable.
- ❑ Present maintenance standards will need to be reviewed. *(For example: do all the areas presently mown in fact need to be cut or can the present mowing frequencies be changed?)*
- ❑ Ensuring best practices are adopted when:
 - Using fertilisers.
 - Using pesticides.
 - Using water.
- ❑ Other issues that could be considered include:
 - Fuel efficient vehicles or vehicles that are capable of running on the “new bio fuels”.
 - Efficient use of lighting and heating.
 - Solar heating.
 - Use of recycled water for irrigation.
 - Water harvesting.
 - Energy self sufficiency. For example: wind, small scale hydro schemes.
 - Developing and implementing a recycling and waste management policy.

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