



# Miscanthus New Zealand Limited

## Submission to Waikato Regional Council.

### Healthy Rivers Wai Ora: Plan Change 1 Waikato and Waipa Rivers Catchments

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### **The submission is about the use and value of Miscanthus in reducing nitrogen leaching and sedimentation to the Waikato and Waipa rivers.**

#### **Relevance**

This submission relates to what is **not** included in the plan change as a whole. It ties into the vision for the rivers – which is long term - the need to reduce nitrogen leaching into and sediment run-off to the rivers, and the objective of Waikato Regional Council (WRC) to apply the latest available scientific methods.

#### **Summary**

This submission alerts WRC to something that does not seem to have been considered or included in any way in its proposed plan change to reduce nitrogen leaching and sedimentation to the Waikato and Waipa rivers. This is the giant grass, Miscanthus. Miscanthus needs to be included in the plan change using existing data and WRC needs to start to collect local data relating to its use in the Waikato Region.

As a high production, sterile and versatile woody perennial grass, Miscanthus has the ability to significantly reduce long term nitrogen leaching – much better than production forest. It can also potentially reduce sedimentation to these rivers, and will at the same time produce a return to the growers. Existing data could provide WRC with justification for requiring use of Miscanthus

stands for disposal of commercial food production effluent (dairy factories, meat works, etc) and even district council sewage effluent disposal. Greenhouse gas (GHG) benefits will also arise at the same time. Any change of land use to Miscanthus growing should therefore be a permitted use because it is so positive for the rivers and for the region.

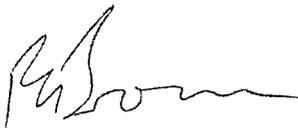
## Key points

1. Miscanthus is a long term perennial, sterile, naturally occurring hybrid grass that annually grows up to 4 metres tall and with good rainfall, has very high annual dry matter production – about twice that of radiata pine. It is also deep rooted with roots reaching up to 2 metres depth. It has no weed potential. Primary uses of the harvested product are for biofuel as a fossil fuel substitute, high quality horse bedding, bedding for other animals – chickens, calves, goats – commercial (organic) mulch and windbreaks on irrigated dairy farms. It also has potential as emergency stock food during droughts.
2. Miscanthus is not an arable crop, a pasture species, a forest species or a vegetable product so it does not fit into any of the existing categories. It really needs to be in a category of its own.
3. Miscanthus is not mentioned in the plan change and to the best of our knowledge is not included in Overseer. If Overseer is to be used to determine acceptable land uses, then data relating to Miscanthus needs to be collected by WRC for inclusion in Overseer. Establishing commercial scale trials / demonstrations of Miscanthus will be needed so that WRC can collect the relevant lysimeter data on nitrogen leaching. In the meantime, independently collected (and now published) Canterbury data, which we can provide, will need to be used.
4. In terms of health of the rivers, land use change from anything else to Miscanthus is positive, even where an initial 100% cultivation approach is required for the Miscanthus establishment. Although the level of nitrogen leaching may be raised during the establishment year, subsequent reduction to less than one twentieth of the level of annual leaching from pine forest and indigenous forest, more than makes up for that. No further cultivation or soil disturbance is needed for at least the next 25 years and probably longer.
5. Carbon stored in soil organic matter also increases annually under Miscanthus stands. Any rules relating to a land use change from an existing use to growing Miscanthus, must look at the long term effect not a single year potential impact, because Miscanthus is a long term and very beneficial crop.
6. Based on the Canterbury (and similar international) data, Miscanthus provides WRC with a land use solution that has almost zero nitrogen leaching once the Miscanthus is established. This gives WRC the opportunity to require disposal of effluent from meat works, dairy factories, breweries and other food processors to Miscanthus stands. It can be expected that this will almost completely eliminate the nitrogen from entering water tables, streams and rivers.
7. In addition, farmers disposing of dairy shed effluent could be required to dispose of this effluent into Miscanthus stands to reduce their nitrogen leaching. The farmers and other growers will then be able to earn annual revenue from these stands.
8. The same could also be applied to district councils' sewage disposal. In fact in another Regional Council area, a detailed proposal for exactly this has recently been put to the local

district council. Yet another Regional Council has already established Miscanthus as riparian strips to protect waterways. WRC could require similar uses of Miscanthus and definitely needs to get up-to-date with this crop and this land use.

9. As well as generating a significant reduction in nitrogen leaching, use of land-based effluent disposal to Miscanthus stands – by commercial food processors mentioned in Item 6 above, will also reduce the amount of water that district councils have to handle through their waste water systems. So as well as the health of the rivers being improved, the district councils should therefore also benefit.
10. Independent Canterbury lysimeter data shows that annual nitrogen leaching from an established Miscanthus stand with dairy factory effluent being spray irrigated onto it, is less than 0.1 kg nitrogen per ha per year. This is considerably better – by a factor of at least 20 - than the next best alternative which is pine or indigenous forest. WRC needs to establish its own Miscanthus stands with deep lysimeters to assess and verify the level of leaching from Miscanthus stands being grown on Waikato soils.
11. While achieving these significant benefits for the Waikato and Waipa rivers, growing Miscanthus in the region can also provide a substitute for fossil fuel use – such as coal – which will reduce the GHG footprint of the Waikato Region as a whole. Major dairy companies and others are already looking at this option in other parts of NZ.
12. Quite separately, there is also huge potential for use of Miscanthus with established USA technology to produce renewable diesel at a very manageable local / regional scale. Note that this is **not** biodiesel but is a direct substitute for existing mineral diesel. There are other beneficial agriculture and river friendly co-products. This will provide regional GHG reduction, income diversity for farmer growers, regional job creation and national balance of payment benefits, all while protecting Waikato's rivers from nitrogen leaching and potentially sedimentation, in a commercially positive manner that has not yet been considered by WRC.
13. Any conversion of land to growing Miscanthus, should be a permitted activity over the whole catchment because the impact on the rivers is so completely beneficial. WRC should lead the way in this.

I wish to speak at the hearings in support of my submission.



P.C. Brown  
7 March 2017