

Hi Luka

Below Overseer (v. 6.2.3) estimates of nitrogen losses to water under three different management scenarios for the Tutaki Block. The three models are attached.

Scenarios 1 and 2 were described in detail in my s.92 report dated 1 September 2016. Scenario 3 is based on a proposed reduction in the nitrogen application limit from the current 200 kg N/ha.y (as a maximum) to an average of 150 kg N/ha.y for grazed pasture.

	Scenario 1 (provided previously)	Scenario 2 (provided previously)	Scenario 3
	~Actual 2014/15		
Irrigation N application (kg N/ha)	175 (actual 2104/15)	200	150
Manure slurry N application (kg N/ha)	87 (actual 2104/15)	200	150
Pond slurry N application (kg N/ha)	0	200	150
Stock type	Sheep and cattle	Sheep and cattle	Sheep only (potentially some cattle in the drier months)
Stocking rate	~Actual 2014/15	~Actual 2014/15	Modelled to match the following estimated pasture dry matter production: - Irrigation areas: 12,700 kg/ha.year - Solids spreading areas: 10,700 kg/ha.year - Buffer zones: 9,400 kg/ha.year
Silage cut and carry (No. bales)	500	500	600 (equivalent to harvesting 3500 kg DM/ha from 50% of the irrigable area each year)
Silage cut and carry (tonnes DM)	142	142	171
Silage cut and used on farm (No. bales)	300	300	0
Estimated average N removed from irrigation areas in "cut-and-carry" silage (assuming silage is 2.3% N dry weight)	33 kg/ha	33 kg/ha	40 kg/ha
Pasture type	Ryegrass/clover	Ryegrass/clover	Ryegrass/clover

Whole farm N lost to water (kg N/ha.y)	27	29	20
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Scenario 3 also includes the following proposed management improvements to reduce N leaching:

- Running sheep-only during the winter months, at stocking rates that do not require supplementary feeding.
- Harvesting silage (or other forage) at a rate that removes at least 40 kg N/ha.year from the irrigation sites (average over all of the irrigation sites) as forage for off-farm use. I consider that this rate of “cut-and-carry” is the maximum that Crusader Meats can commit to, taking onto account the following:
 - The high and variable rainfall.
 - Only around 70% of the total irrigation area is suitable for harvesting pasture silage and other potential cut-and-carry forage crops.
 - Pasture being grown for silage production cannot be irrigated, as the effluent can affect the palatability of the silage. This significantly restricts the amount of land that can be set aside for silage production at any one time.
 - The unavailability of paddocks for silage production while they are being cultivated and re-grassed.

As you can see, the improved management practices will substantially reduce nitrogen losses to water - from approximately 29 kg/ha.year to 20 kg/ha.year.

Nitrogen leaching rates from the Te Hape block are expected to be similar to those estimated for the Tutaki Block, although there may be small differences in management practices, such as animals types and supplementary feeding in winter.

Regards
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