

Additional OVERSEER modelling assumptions - where non default figures used

Scenario1 - Cubicle stables

- Average cow weight - 525 kg (B Englebrecht, Pers Comm 2010).
- Milk production 350-400 kg MS/cow (Englebrecht, 2009)
- 500 mm rainfall (GHD, 2009)
- 801-950 mm PET (from Tara Hills Research Station average PET)
- Low clover content. Clover levels are expected to be depressed due to the substantial and even return of organic manure. Low clover content also give greater control over inputs in initial stages of development. However, going forward, clover contents could be monitored and increased and inorganic N reduced accordingly and accompanied by lysimeter monitoring.
- Own irrigation concentrations used. The default irrigation concentration for N is 2.5 mg/l N. The source of water for WHL Killermont is from the Ahuriri River. Water quality testing at South Diadem on the Ahuriri River (WQS Summary Report Appendix AA) found an average total N concentration of 0.14 mg/l¹ with most samples below detection levels. The use of 0.5 mg/l is therefore conservative. Default concentrations in OVERSEER also overestimate the phosphorus in WHL Killermont's irrigation water, with an average of 0.01² mg/l TP at South Diadem compared with 0.1 mg/l TP assumed in OVERSEER (WQS Summary Report Appendix AA). However it was not possible to adjust these concentrations downwards.

It should be noted that in this system stock are proposed to be housed completely for 8 months of the year and partially for the remainder of the time. This is a longer period of time than that which can be modelled in OVERSEER version 5.3.4, and therefore is likely to overestimate losses in this system as modelled.

Scenario 2 - Cut and Carry plus arable

- Cut and carry modelled using APSIM. As a proxy until this is complete, N losses used are 5 kg/ha and 7.5 kg/ha for Developed and Highly Developed respectively and 0.4 kg/ha P loss.
- 500 mm rainfall (GHD, 2009)
- 801-950 mm PET (from Tara Hills Research Station average PET)
- Own irrigation concentrations used (as above)
- 2nd wheat crop assumed to be harvested for whole crop silage

Scenario 3 - Sheep and Beef plus cut and carry plus arable

- Cut and carry as above.
- 500 mm rainfall (GHD, 2009)
- 801-950 mm PET (from Tara Hills Research Station average PET)
- Own irrigation concentrations used (as above)
- 2nd wheat crop assumed to be harvested for whole crop silage
- Lambs purchased to finish over the summer between December and April;
- Merino hoggets bought 'off shears' in September and sold by mid December at 44 kg (liveweight);
- Weaned bull calves are purchased in November and raised to 17-19 months at 550 kg (liveweight); and

¹ Samples below detection taken at the detection limit

² Samples below detection taken at detection limit of 0.001 mg TP/l

- Weaned calves for replacement heifers are purchased in December and raised to 22 months and are transferred back to dairy farms at 480 kg
- Wetland areas, as above.
- At Highly Developed, sheep and beef enterprise area decreased to maintain compliance with threshold
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Scenario 4 - Mixed enterprise - Dairy plus sheep and beef plus cut and carry plus arable

- Cut and carry as above.
- 500 mm rainfall (GHD, 2009)
- 801-950 mm PET (from Tara Hills Research Station average PET)
- Own irrigation concentrations used (as above)
- 2nd wheat crop assumed to be harvested for whole crop silage
- Lambs purchased to finish over the summer between December and April;
- Merino hoggets bought 'off shears' in September and sold by mid December at 44 kg (liveweight);
- Weaned bull calves are purchased in November and raised to 17-19 months at 550 kg (liveweight); and
- Weaned calves for replacement heifers are purchased in December and raised to 22 months and are transferred back to dairy farms at 480 kg
- Average cow weight - 525 kg (B Englebrecht, Pers Comm 2010).
- Milk production 350-400 kg MS/cow (Englebrecht, 2009)
- At Highly Developed, sheep and beef enterprise area decreased to maintain compliance with threshold