

OVERSEER®



Nicole Phillips

Overview

1. OVERSEER® Basics
2. Overview of OVERSEER® inputs for Irrigation management
3. Describing your irrigation system and the importance of providing accurate information
4. Nitrogen loss under different irrigation systems and soils
5. Questions – please ask at anytime

OVERSEER® Basics

- Just like a financial budget, tells you how much is coming in and going out from a farming system and to where
- Three underlying assumptions of the model
 - Farm system at equilibrium
 - Assumes GMP
 - Actual and Reasonable inputs
- Inputs are entered at a block e.g. fertiliser, topography, soil type, irrigation method and farm level e.g. farm type, location

OVERSEER® Basics

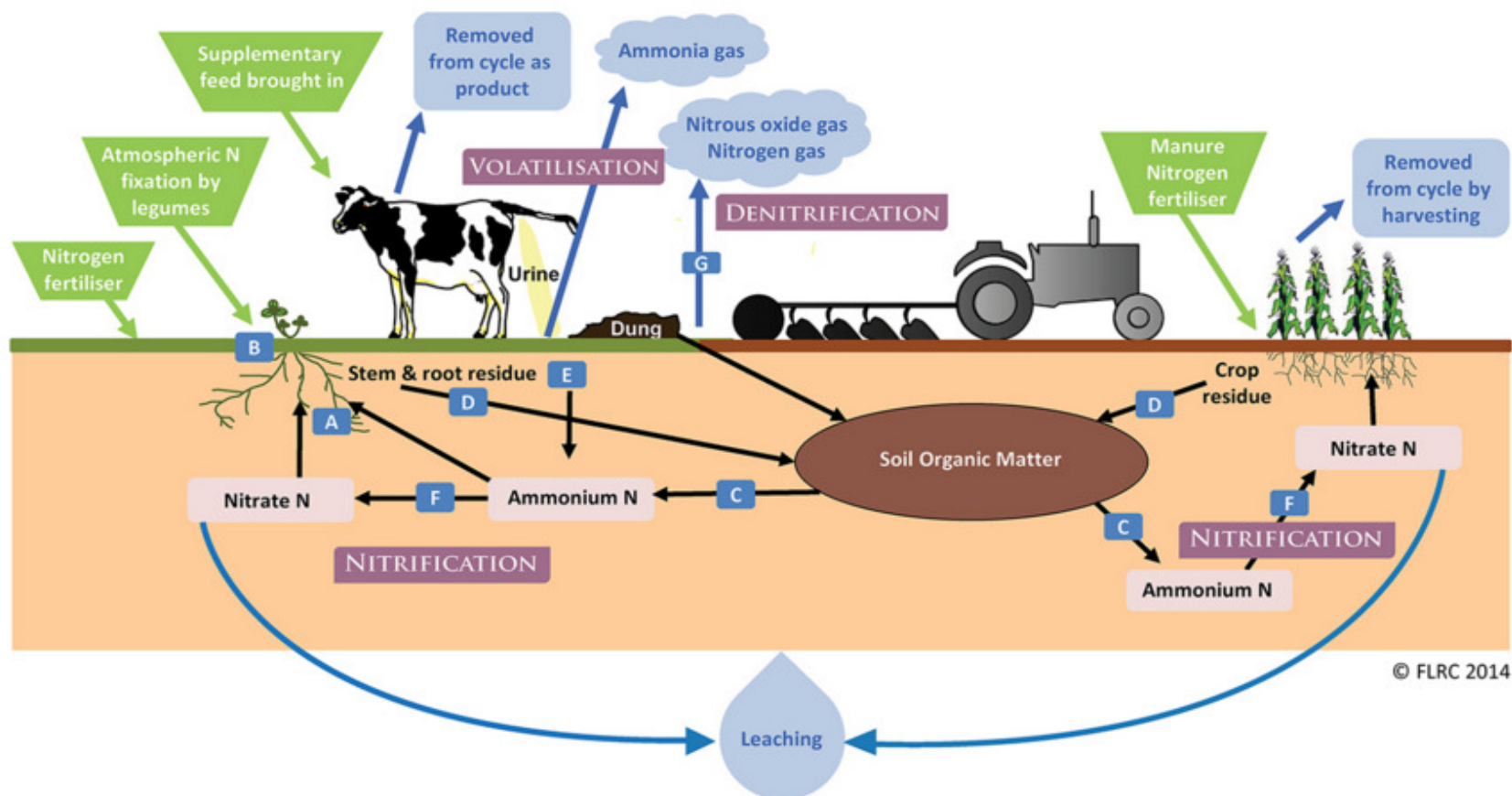
- Allows for 'What if' scenarios to be modelled to predict the likely impact of changes in management practices or farm systems
- No economic analysis included – so other tools are needed as well – particularly important when completing scenarios
- **Overseer only estimates nutrient loss below the root zone (N) or beyond the farm boundary (P) not what reaches the receiving environment**

OVERSEER® Basics

- Relatively easy to model simple farm system e.g. dairy
 - Becomes more complex with numerous irrigation systems and soil types
- Complex farm systems; more time consuming to model and more detail required e.g. Arable or trading stock
 - often work arounds needed – especially when dealing with stock grazing
 - Limited quantity of crops that can be modelled – find the best fit

OVERSEER® Basics

Figure 1. Inputs, outputs and transformations of nitrogen in farming systems



Nicole Phillips
Irricon Resource Solutions
26/02/2016

Client reference:

Farm name: INZ Presentation Mar 2016 Model 1

Farm Nutrient Budget - Whole farm



	N	P	K	S	Ca	Mg	Na
	(kg/ha/yr)						
Nutrients added							
Fertiliser, lime & other	224	43	0	108	105	0	0
Rain/clover N fixation	86	0	2	3	1	2	10
Irrigation	14	1	9	14	53	13	54
Supplements imported	79	17	31	11	2	7	3
Nutrients removed							
As products	118	21	26	7	29	2	8
Exported effluent	0	0	0	0	0	0	0
As supplements	0	0	0	0	0	0	0
To atmospheric	93	0	0	0	0	0	0
To water	56	2	14	120	74	7	25
Change in internal pools							
Plant material	0	0	0	0	0	0	0
Organic pool	136	13	1	10	0	0	0
Inorganic mineral	0	7	-32	0	-1	-1	-1
Inorganic soil pool	0	17	33	0	59	14	36

Nutrient budget

(kg/ha/yr)	N	P	K	S	Ca	Mg	Na	H ⁺ *
Nutrients added								
Fertiliser, lime & other	224	43	0	108	105	0	0	1.2
Rain/clover N fixation	93	0	2	3	1	2	10	0.1
Irrigation	9	0	6	9	33	8	33	0.0
Effluent added	77	8	76	7	10	5	2	-1.7
Supplements fed on block	48	11	24	9	1	5	2	0.5
Nutrients removed								
As animal products	118	21	26	7	29	2	8	0.0
As supplements	0	0	0	0	0	0	0	0.0
Net transfer by animals	38	1	39	3	7	3	0	-1.2
To atmosphere	75	0	0	0	0	0	0	0.0
To water	32	0.1	8	116	47	1	2	-1.9
Leaching - urine patches	26	0.0	5	0	21	0	0	-1.9
Leaching - other	5	0.0	3	116	26	1	2	-0.1
Runoff	0	0.1	0	0	0	0	0	0.0
Direct (animals, drains)	0	0.0	0	0	0	0	0	0.0
Direct pond discharge	0	0.0	0	0	0	0	0	0.0
Border dyke outwash	0	0.0	0	0	0	0	0	0.0
Septic tank outflow	0	0.0	0	0	0	0	0	0.0
Change in block pools								
Organic pool	189	11	0	11	0	0	0	0.2
Inorganic mineral	0	11	-15	0	-1	-1	-1	0.0
Inorganic soil pool	0	19	48	0	67	16	38	3.0

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Block Nitrogen

OVERSEER®

Block name	Total N lost (kg N/yr)	N lost to water (kg N/ha/yr)	N in drainage * (ppm)	N surplus (kg N/ha/yr)	Added N ** (kg N/ha/yr)
Roto Shallow	1362	54	21.9	275	236
Pivot Shallow	788	32	23.9	334	302
BDyke Shallow	3979	159	18.9	234	224
Roto Mod Deep	371	15	13.4	262	224
Pivot Mod Deep	507	20	16.9	333	302
Other farm sources	18				
Whole farm	7026	56			
Less N removed in wetlands	0				
Farm output	7026	56			

OVERSEER® and Irrigation

- V6.2.0 - Change in Irrigation Management and inputs available
- Current Version - V6.2.1

OVERSEER® and Irrigation

- Sample farm
 - 3 irrigation methods
 - 2 soil types
 - Only irrigation inputs changing
- Question?
 - How do you manage your irrigation?
 - Look at three different ways to model
 1. Fixed/Fixed
 2. Variable/Fixed with defaults
 3. Variable/fixed with average water use based on climate and soil



OVERSEER® and Irrigation

- Fixed/Fixed system – no changes to return period during any part of the season

Nutrient budget					
Nitrogen					
Phosphorus					
Graph - N pools					
Graph - changes in N pools					
Comments					
Maintenance nutrients					
Relative yield					
Other values					
Block name	Total N lost kg N/yr	N lost to water kg N/ha/yr	N in drainage * ppm	N surplus kg N/ha/yr	Added N ** kg N/ha/yr
Roto Shallow	3728	149	12.5	248	236
Pivot Shallow	3555	142	20.1	370	303
BDyke Shallow	4049	162	19.3	234	224
Roto Mod Deep	3449	138	16.9	311	224
Pivot Mod Deep	3378	135	18.8	357	303
Other sources	19				
Whole farm	18179	145			
Less N removed in wetland	0				
Farm output	18179	145			

- More input detail provided
- Variable/Fixed
 - OVERSEER® defaults used

Nutrient Budget	Nitrogen	Phosphorus	Comments	Summary	Nitrogen overview
Phosphorus overview	Greenhouse gases	Energy	Footprint units	Footprint product	
Effluent	Pasture production	Other values	Full parameter report		
Block name	Total N lost kg N/yr	N lost to water kg N/ha/yr	N in drainage * ppm	N surplus kg N/ha/yr	Added N ** kg N/ha/yr
Roto Shallow	1362	54	21.9	275	236
Pivot Shallow	788	32	23.9	334	302
BDyke Shallow	3979	159	18.9	234	224
Roto Mod Deep	371	15	13.4	262	224
Pivot Mod Deep	507	20	16.9	333	302
Other sources	18				
Whole farm	7026	56			
Less N removed in wetland	0				
Farm output	7026	56			

- Difference in water applied mm/ha/yr

	Model 1	Model 2
Roto Shallow	1395	450
Pivot Shallow	910	330
Bdyke Shallow	1105	1105
Roto Mod Deep	1045	330
Pivot Mod Deep	925	341
N lost to water kg/ha/yr	145	56

- Is Model 2, applying enough irrigation water per hectare?

- Model 2 not applying enough water per hectare
- Need to go back into OVERSEER ® and amend to model a long term average irrigation application rate (9 out of 10 years)

	Average irrigation water use mm/ha/yr – based on climate and soil data
Roto shallow	588
Pivot Shallow	377
Roto Mod Deep	430
Pivot Mod Deep	352

- Average irrigation volumes used
- Variable/Fixed

Nutrient Budget	Nitrogen	Phosphorus	Comments	Summary	Nitrogen overview
Phosphorus overview	Greenhouse gases	Energy	Footprint units	Footprint product	
Effluent	Pasture production	Other values	Full parameter report		
Block name	Total N lost kg N/yr	N lost to water kg N/ha/yr	N in drainage * ppm	N surplus kg N/ha/yr	Added N ** kg N/ha/yr
Roto Shallow	2163	87	22.6	287	236
Pivot Shallow	868	35	22.2	335	302
BDyke Shallow	4002	160	19.0	234	224
Roto Mod Deep	827	33	15.6	263	224
Pivot Mod Deep	562	22	15.4	334	302
Other sources	19				
Whole farm	8440	68			
Less N removed in wetland	0				
Farm output	8440	68			

- Comparison
 - Irrigation Application rates mm/ha/yr

	Model 1	Model 2	Model 3 - Average
Roto Shallow	1395	450	585
Pivot Shallow	910	330	360
Bdyke Shallow	1105	1105	1105
Roto Mod Deep	1045	330	440
Pivot Mod Deep	925	341	350

- Difference in N loss kg N/ha/yr
 - Soils and irrigation inputs

	Model 1	Model 2	Model 3
	Fixed/Fixed	Defaults Variable/Fixed	Based on average irrigation water use for climate and water holding capacity
Roto Shallow	149	54	87
Pivot Shallow	142	32	35
Bdyke Shallow	162	159	160
Roto Mod Deep	138	15	33
Pivot Mod Deep	135	20	22
Average N loss kg N/ha/yr	145	56	68

Importance of Compliance with ALIL requirements

- Benefits of being part of a scheme
 - No requirement for your own land use consent to farm and deal with Planning requirements that are complex and forever changing
 - Dealing with people who can understand your farming system and its complexities
- DOESN'T stop the need to comply with requirements and timing e.g. FEP, Nutrient Budget
 - Non compliance may mean a more stringent consent for ALIL when renewed

Key points

- Complex model – only as good as the information provided
- Rubbish in – Rubbish out
- Know your number and what it means
- Provide accurate information
- Check!!



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