Eutrophication from Agriculture Sources
2000-LS-2-M2

FINAL REPORT (SECTION 2 OF 3)

Nitrate Leaching - Farm Scale
(2000- L S 2.3.1.1-M2)

Appendices of Data Collected

March 2006

Prepared for the Environmental Protection Agency

by

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Nitrate Leaching – Farm Scale
2000-LS- 2.3.1.1-M2

Final Report
Final Report Section 2 of 3 – Appendices of Data Collected

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Introduction

In this, the second Section of the Final Report, all the background data collected in the course of the Nitrate Leaching - Farm Scale study (2000 – LS 2.3.1.1 –M2) are tabulated. These include nitrogen (N) inputs, concentrations and loads in fertiliser and organic manures in Appendices 1, 2, 3. The number of half-day grazing by cows in 2001-2004; herbage-on-offer dry matter (DM) and N yields plus crude protein concentrations are included for 2001-2003 in Appendices 4, 5. Analysis of variance of the carbon (C), N concentrations and C/N ratios in soil samples, for one sampling date (December 2003), in all plots is shown in Appendix 6. Appendices 7, 8, 9 show nitrate nitrogen (NO_3-N) and ammonium nitrogen (NH_4-N) concentrations for all the ceramic cups in all plots over the three drainage seasons together with weekly effective rainfall (drainage) amounts.

Appendix 1. A summary of the nitrogen inputs for each measurement plot and all treatments for 2001, 2002, 2003 and 2004. (Treatment, Plot No.,, date of application, N type, N application rate and total N applied to each plot for each year).

Fertilising Curtin`s		**2001**			**2002**		
Treatment	**Plot**	**Date**	**Fert type**	**kg/ha**	**Date**	**Fert type**	**kg/ha**
1cutsilage	Blue 3	16/01	Urea	56.8	13/01	27N+5%S	50.0
		16/04	CAN	133.4	04/04	Urea	99.4
	Area (ha)	28/05	27N+5%S	33.3	12/06	27%N	50.0
	0.8652	25/06	CAN	33.3	24/07	27%N	33.3
		25/07	CAN	33.3	19/08	27%N	33.3
		22/08	CAN	33.3			
	subtotal			323.6		Subtotal	266.0
		27/03	*slurry	*20.3	29/3	Slurry	18.0
TOTAL N(kg/ha)				*343.9*			*284.0*
1cutsilage	Blue 5	16/01	Urea	56.8	19/01	27N+5%S	50.0
		04/04	CAN	116.7	03/04	Urea	99.4
	Area (ha)	29/05	27N+5%S	49.4	12/06	27%N	50.0
	0.8652	26/06	CAN	33.3	16/07	27%N	33.3
		27/07	CAN	33.3	13/08	27%N	33.3
		12/09	CAN	33.3			
	subtotal			323		Subtotal	266.0
		27/3	*slurry	*21.2	28/3	Slurry	25.0
TOTAL N(kg/ha)				*344.2*			*291.0*
1cutsilage	Blue 6	16/01	Urea	56.8	22/01	27N+5%S	50.0
		04/04	CAN	116.7	03/04	Urea	99.4
	Area (ha)	29/05	27N+5%S	49.4	10/06	UREA	49.4
	0.8657	30/06	CAN	33.3	19/07	27%N	33.3
		01/08	CAN	33.3	17/08	27%N	33.3
		12/09	CAN	33.3			
	subtotal			323.0		Subtotal	265.4
			*slurry27/3	*24.4	27/3	Slurry	24.0
TOTAL N (kg/ha)				*347.4*			*289.4*

Appendix 1 - continued. A summary of the nitrogen inputs for each measurement plot and all treatments for 2001, 2002, 2003 and 2004. (Treatment, Plot No., date of application, N type, N application rate and total N applied to each plot for each year).

Fertilising Curtin`s		**2001**			**2002**		
Treatment	**Plot**	**Date**	**Fert type**	**kg/ha**	**Date**	**Fert type**	**kg/ha**
D.water	Blue 10	16/01	Urea	56.8	20/02	UREA	37.5
		27/04	CAN	49.4	26/04	UREA	49.4
	Area (ha)	30/05	CAN	33.3	27/05	UREA	49.4
	0.8135	06/07	CAN	33.3	28/06	27%N	50.0
		03/08	CAN	33.3	30/07	27%N	33.3
					09/09	27%N	33.3
Dirty water irrigation summer						subtotal	253.0
01 amounts not recorded					29/4-1/5	d.water	3.2
					1/6-5/6	d.water	1.9
					29/7-31/7	d.water	6.8
					9/9-16/9	d.water	9.0
					28/10-4/11	d.water	6.2
						subtotal	27.1
TOTAL N (kg/ha)				*206.2*			*280.1*
D.water	Blue 11	16/01	Urea	56.8	20/02	UREA	37.5
		17/04	CAN	49.4	13/04	UREA	49.4
	Area (ha)	09/07	CAN	33.3	15/05	UREA	49.4
	0.775	15/09	CAN	33.3	18/06	27%N	50.0
	Subtotal			172.9	12/07	27%N	33.3
	d.water	28/11-7/12		67	09/08	27%N	43.3
					10/09	27%N	33.3
						subtotal	296.3
					18/5-22/5	d.water	0.6
					17/6-24/6	d.water	16.9
					23/12-1/1	d.water	10.6
						subtotal	28.1
TOTAL N (kg/ha)				*239.9*			*324.4*
D.water	Blue 12	16/01	Urea	56.8	Feb-19	UREA	37.5
		23/04	CAN	49.4	Apr-13	UREA	49.4
	Area (ha)	22/05	CAN	33.3	May-18	UREA	49.4
	0.8649	18/06	CAN	33.3	Jun-18	27%N	50.0
		18/07	CAN	33.3	Jul-12	27%N	33.3
		21/09	CAN	33.3	Aug-12	27%N	33.3
	subtotal			239.6	Sep-21	27%N	33.3
	d.water	6/11-27/11		42		subtotal	286.3
					22/5-24/5	d.water	0.5
					12/8-14/8	d.water	18
					25/11-6/12	d.water	18
						subtotal	36.5
TOTAL N (kg/ha)				*281.6*			*322.8*

Appendix 1 - continued. A summary of the nitrogen inputs for each measurement plot and all treatments for 2001, 2002, 2003 and 2004. (Treatment, Plot No., date of application, N type, N application rate and total N applied to each plot for each year).

Fertilising Curtin`s		**2001**			**2002**		
Treatment	**Plot**	**Date**	**Fert type**	**kg/ha**	**Date**	**Fert type**	**kg/ha**
Grazed	Blue 13	16/01	Urea	56.8	30/01	27N+5%S	50.0
		17/04	CAN	49.4	29/04	UREA	49.4
	Area (ha)	14/05	CAN	33.3	03/06	UREA	49.4
	0.45	13/06	CAN	33.3	05/07	27%N	50.0
		18/07	CAN	33.3	03/08	27%N	33.3
		14/08	CAN	33.3	30/08	27%N	33.3
TOTAL N (kg/ha)				*239.6*			*265.4*
Grazed	Blue 17	16/01	Urea	56.8	30/01	27N+5%S	50.0
		17/04	CAN	49.4	23/04	UREA	49.4
	Area (ha)	07/05	CAN	33.3	25/05	UREA	49.4
	0.919	11/07	CAN	33.3	22/06	27%N	50.0
		08/08	CAN	33.3	23/07	27%N	33.3
					21/08	27%N	33.3
TOTAL N (kg/ha)				*206.2*			*265.4*
Grazed	Blue 19	16/01	Urea	56.8	30/01	27N+5%S	50.0
		17/04	CAN	49.4	29/04	UREA	49.4
	Area (ha)	14/05	CAN	33.3	05/06	UREA	49.4
	0.8837	12/06	CAN	33.3	29/06	27%N	50.0
		09/07	CAN	33.3	30/07	27%N	33.3
		01/08	CAN	33.3	26/08	27%N	33.3
		18/09	CAN	33.3			
TOTAL N (kg/ha)				*272.9*			*265.4*

Appendix 1 - continued. A summary of the nitrogen inputs for each measurement plot and all treatments for 2001, 2002, 2003 and 2004. (Treatment, Plot No., date of application, N type, N application rate and total N applied to each plot for each year).

Fertilising Curtin`s		**2001**			**2002**		
Treatment	**Plot**	**Date**	**Fert type**	**kg/ha**	**Date**	**Fert typ**	**kg/ha**
2cutsilage	Blue 15	06/01	Urea	56.8	09/01	27N+5%S	50.0
		04/04	CAN	116.7	12/04	Urea	99.4
	Area (ha)	29/05	CAN	100.0	14/06	27%N	99.4
	0.8499	20/07	CAN	49.4	29/07	27%N	50.0
		20/08	10:10:20	37.1	21/08	27%N	33.3
	subtotal			360.0		subtotal	332.2
		27/3	*slurry	*26	15/4	slurry	26.0
TOTAL N (kg/ha)				*386.0*			*358.2*
2cutsilage	Blue 16	16/01	Urea	56.8	09/01	27N+5%S	50.0
		04/04	CAN	116.7	12/04	Urea	99.4
	Area (ha)	29/05	CAN	100.0	14/06	27%N	99.4
	0.85	20/07	CAN	49.4	30/07	27%N	50.0
		21/08	CAN	33.3	27/08	27%N	33.3
	subtotal			356.3		subtotal	332.2
		27/3	*slurry	*25	16/4	slurry	25.0
TOTAL N (kg/ha)				*381.3*			*357.2*
2cutsilage	Blue 8	16/01	Urea	56.8	22/01	27N+5%S	50.0
		04/04	CAN	133.4	12/04	Urea	99.4
	Area (ha)	29/05	CAN	100.0	12/06	27%N	100.0
	1.257	27/07	CAN	49.4	29/07	27%N	50.0
		12/09	CAN	33.3	19/9	27%N	33.3
	subtotal			372.9		subtotal	332.8
		2/4	*slurry 2/4	*30	2/4	slurry	30.0
TOTAL N (kg/ha)				*402.9*			*362.8*

available N = 25% total N in slurry

* rates,dates approximate;light unknown rate jan 01

Appendix 1 - continued. A summary of the nitrogen inputs for each measurement plot and all treatments for 2001, 2002, 2003 and 2004. (Treatment, Plot No., date of application, N type, N application rate and total N applied to each plot for each year).

Fertilising Curtin`s		**2003**			**2004**		
Treatment	**Plot**	**Date**	**Fert type**	**kg/ha**	**Date**	**Fert typ**	**kg/ha**
1cut silage	Blue 3	25/01	Urea	49.4	19/01	UREA	49.4
		01/04	Urea	99.4	07/04	UREA	99.4
	Area (ha)	02/06	Urea	49.4	28/05	27/2.5/5	49.4
	0.8652	07/07	27:2.5:5	33.3	21/06	27/2.5/5	33.3
		04/08	27:2.5:5	33.3	17/07	27/2.5/5	33.3
		05/08	27:2.5:5	33.3	13/08	27/2.5/5	33.3
	subtotal			298.3		subtotal	298.3
		18/3	slurry	22.0	30/03	slurry	40
TOTAL N (kg/ha)				*320.3*			*338.3*
1cut silage	Blue 5	25/01	Urea	49.4	20/01	UREA	49.4
		02/04	Urea	99.4	03/04	UREA	99.4
	Area (ha)	02/06	Urea	49.4	28/05	27/2.5/5	49.4
	0.8652	04/07	27:2.5:5	33.3	23/06	27/2.5/5	33.3
		01/08	27:2.5:5	33.3	21/07	27/2.5/5	33.3
		03/08	27:2.5:5	33.3	17/08	27/2.5/5	33.3
	subtotal			298.3		subtotal	298.3
		18/03	slurry	22.0	26/03	slurry	30
TOTAL N (kg/ha)				*320.3*			*328.3*
1cutsilage	Blue 6	25/01	Urea	49.4	20/01	UREA	49.4
		02/04	Urea	99.4	03/04	UREA	99.4
	Area (ha)	02/06	Urea	49.4	01/06	27/2.5/5	49.4
	0.8657	28/06	27:2.5:5	33.3	29/06	27/2.5/5	33.3
		29/07	27:2.5:5	33.3	20/07	27/2.5/5	33.3
		23/08	27:2.5:5	33.3	17/08	27/2.5/5	33.3
	subtotal			298.3		subtotal	298.3
		18/03	slurry	23.0	26/03	slurry	38
TOTAL N (kg/ha)				*321.3*			*336.3*

Appendix 1 - continued. A summary of the nitrogen inputs for each measurement plot and all treatments for 2001, 2002, 2003 and 2004. (Treatment, Plot No., date of application, N type, N application rate and total N applied to each plot for each year).

Fertilising Curtin`s		**2003**			**2004**		
Treatment	**Plot**	**Date**	**Fert type**	**kg/ha**	**Date**	**Fert typ**	**kg/ha**
D.water	Blue 10	14/03	Urea	49.4	06/03	UREA	49.4
		26/04	Urea	49.4	24/04	UREA	49.4
	Area (ha)	24/05	Urea	49.4	24/05	27/2.5/5	49.4
	0.8135	24/06	27%N+5%S	33.3	12/06	27/2.5/5	33.3
		23/07	27:2.5:5	33.3	07/07	27/2.5/5	33.3
		18/08	27:2.5:5	33.3	30/07	27/2.5/5	33.3
	subtotal			248.2	10/09	27/2.5/5	33.3
	28/04-5/05		d.water	14.6		subtotal	281.4
	24/5-3/06		d.water	84.7	31/12-10/01	d.water	6.0
	23/7-4/08		d.water	21.4	8/03-16/03	d.water	19.3
	1/10-9/10		d.water	23.6	20/09-2/10	d.water	43.0
	subtotal			144.3	20/12-/29/12	d.water	11.1
						subtotal	79.4
TOTAL N (kg/ha)				*392.5*			*360.8*
D.water	Blue 11	14/03	Urea	49.4	23/03	UREA	49.4
	Area (ha)	26/04	Urea	49.4	27/04	UREA	49.4
	0.775	28/05	Urea	49.4	24/05	27/2.5/5	49.4
		23/06	27%N+5%S	33.3	14/06	27/2.5/5	33.3
		23/07	27:2.5:5	33.3	09/07	27/2.5/5	33.3
		16/08	27:2.5:5	33.3	30/07	27/2.5/5	33.3
	subtotal			248.2		subtotal	248.1
	24/02-17/03		d.water	36.9	24/03-07/04	d.water	63.0
	15/10-22/10		d.water	18.8	04/08-14/08	d.water	27.3
	15/12-23/12		d.water	9.7	28/10-8/11	d.water	27.4
	subtotal			65.4		subtotal	117.7
TOTAL N (kg/ha)				*313.6*			*365.8*
D.water	Blue 12	01/04	Urea	49.4	21/04	UREA	49.4
	Area (ha)	07/05	Urea	49.4	15/05	UREA	49.4
	0.8649	03/06	Urea	49.4	09/06	27/2.5/5	33.3
		30/06	27%N+5%S	33.3	02/07	27/2.5/5	33.3
		29/07	27:2.5:5	33.3	27/07	27/2.5/5	33.3
		06/09	27:2.5:5	33.3	24/08	27/2.5/5	33.3
	Subtotal			248.2		subtotal	232.0
	30/01-24/02		d.water	39.0	13/02-25/02	d.water	19.4
	16/05-24/05		d.water	10.4	23/04-07/05	d.water	41.4
	14/06-19/06		d.water	14.4	12/07-24/07	d.water	32.5
	9/12-15/12		d.water	12.5	16/10-26/10	d.water	28.2
	Subtotal			76.3		subtotal	121.5
TOTAL N (kg/ha)				*324.5*			*353.5*

Appendix 1 - continued. A summary of the nitrogen inputs for each measurement plot and all treatments for 2001, 2002, 2003 and 2004. (Treatment, Plot No., date of application, N type, N application rate and total N applied to each plot for each year).

Fertilising Curtin`s		**2003**			**2004**		
Treatment	**Plot**	**Date**	**Fert type**	**kg/ha**	**Date**	**Fert type**	**kg/ha**
Grazed	Blue 13	28/01	Urea	49.4	21/01	UREA	49.4
		11/04	Urea	49.4	07/04	UREA	49.4
	Area (ha)	24/05	Urea	49.4	04/05	UREA	49.4
	0.45	13/06	27:2.5:5	33.3	28/05	27/2.5/5	49.4
		14/07	27:2.5:5	33.3	18/06	27/2.5/5	33.3
		12/08	27:2.5:5	33.3	14/07	27/2.5/5	33.3
		16/09	27:2.5:5	33.3	09/08	27/2.5/5	33.3
TOTAL N (kg/ha)				*281.6*			*297.6*
Grazed	Blue 17	28/01	Urea	49.4	21/01	UREA	49.4
		15/04	Urea	49.4	12/04	UREA	49.4
	Area (ha)	12/05	Urea	49.4	07/05	UREA	49.4
	0.919	09/06	Urea	49.4	02/06	27/2.5/5	49.4
		09/07	27:2.5:5	33.3	25/06	27/2.5/5	33.3
		08/08	27:2.5:5	33.3	14/07	27/2.5/5	33.3
		19/09	27:2.5:5	33.3	25/08	27/2.5/5	33.3
TOTAL N (kg/ha)				*297.6*			*297.6*
Grazed	Blue 19	28/01	Urea	49.4	21/01	UREA	49.4
		16/04	Urea	49.4	13/04	UREA	49.4
	Area (ha)	14/05	Urea	49.4	08/05	UREA	49.4
	0.8837	13/06	27:2.5:5	49.4	05/06	27/2.5/5	49.4
		14/07	27:2.5:5	33.3	21/06	27/2.5/5	33.3
		09/08	27:2.5:5	33.3	17/07	27/2.5/5	33.3
		16/09	27:2.5:5	33.3	10/08	27/2.5/5	33.3
TOTAL N (kg/ha)				*297.6*			*297.6*

Appendix 1 - continued. A summary of the nitrogen inputs for each measurement plot and all treatments for 2001, 2002, 2003 and 2004. (Treatment, Plot No., date of application, N type, N application rate and total N applied to each plot for each year).

Fertilising Curtin`s		**2003**			**2004**		
Treatment	**Plot**	**Date**	**Fert type**	**kg/ha**	**Date**	**Fert type**	**kg/ha**
2cut silage	Blue 15	27/01	Urea	49.4	20/01	UREA	49.4
		08/04	Urea	99.4	12/04	UREA	99.4
	Area (ha)	07/06	Urea	98.8	02/06	27/2.5/5	49.4
	0.768	28/07	27:2.5:5	33.3	09/07	27/2.5/5	33.3
		19/08	27:2.5:5	33.3	09/08	27/2.5/5	33.3
	subtotal			314.3		Subtotal	264.9
		28/03	slurry	23.0	03/04	Slurry	43
TOTAL N (kg/ha)				*337.3*			*307.9*
2cut silage	Blue 16	27/01	Urea	49.4	20/10	UREA	49.4
		08/04	Urea	99.4	12/04	UREA	99.4
	Area (ha)	06/06	Urea	98.8	02/06	27/2.5/5	49.4
	0.85	26/07	27:2.5:5	33.3	09/07	27/2.5/5	33.3
		25/08	27:2.5:5	33.3	07/08	27/2.5/5	33.3
	subtotal			314.3		Subtotal	264.9
		28/03	slurry	21.0	03/04	Slurry	40.0
TOTAL N (kg/ha)				*335.3*			*304.9*
2cut silage	Blue 8	27/01	Urea	49.4	20/01	UREA	49.4
		04/04	Urea	99.4	06/04	UREA	99.4
	Area (ha)	04/06	Urea	98.8	04/06	UREA	99.4
	1.257	25/07	27:2.5:5	33.3	21/07	27/2.5/5	33.3
		12/09	27:2.5:5	33.3	24/08	27/2.5/5	33.3
	subtotal			314.3		Subtotal	314.9
		27/03	slurry	22.0	30/03	Slurry	40
TOTAL N (kg/ha)				*336.3*			*354.9*

Appendix 2: A summary of the slurry applications to the silage plots (1-cut and 2-cut treatments) including plot number, application date, application rate, total N (mg/kg), total P (mg/kg), DM (%), total N applied per plot (kg/ha) and available N (25% of total N) applied per plot (kg/ha).

Plot	Date	T/ha	Tot. N (mg/kg)	Tot. P (mg/kg)	DM (%)	N (kg/ha)	Available N
6	27/03/02	27.5	3475	676	7.15	96	24
5	28/03/02	28.0	3513	698	7.55	98	25
3	29/03/02	28.0	2606	553	7.80	73	18
8	2/0402	28.5	4144	876	9.45	118	30
15	15/04/02	27.7	3691	688	7.10	102	26
16	16/04/02	28.4	3542	662	12.60	101	25
3	18/03/03	33.7	2566	381	5.67	87	22
6	18/03/03	34.2	2642	413	4.94	90	23
5	18/03/03	33.1	2658	411	5.39	88	22
8	27/03/03	34.4	2587	395	2.07	89	22
16	28/03/03	31.6	2608	405	2.15	82	21
15	28/03/03	35.6	2603	413	1.93	93	23
5	26/03/04	32.6	3688	943	7.61	120	30
6	26/03/04	38.1	4000	1042	7.57	152	38
8	30/03/04	37.1	4320	1080	7.52	160	40
3	30/03/04	37.2	4256	1085	7.78	158	40
16	03/04/04	40.7	3958	958	7.68	161	40
15	03/04/04	40.7	4208	1042	7.26	171	43

Appendix 3: A summary of the dirty water applications to the dirty water treatment plots including date of application, plot number, plot area, volume applied (l), NH_4-N, NO_3-N, total N and total P concentration (mg/l) of dirty water applied.

Date	Plot	Area (ha)	Vol.spread (l)	NH_4N (mg/l)	NO_3N (mg/l)	Tot.N (mg/l)	Tot.P (mg/l)
29/4/02 - 1/5/02	10	0.8135	28,481	72.2	0.1	108.0	
1/6/02 - 5/6/02	10	0.8135	46,052	3.7	0.0	40.0	150.0
29/7/02 - 31/7 02	10	0.8135	20,575	189.0	0.0	318	N/A
9/9/02 - 16/9/02	10	0.8135	39,068	73.4	0.0	220	45
28/10/02 - 4/11/02	10	0.8135	79,475	27.9	0.0	75	20
28/4/03 - 5/5/03	10	0.8135	52,288	169.0	0.1	267	43
24/5/03 - 3/6/03	10	0.8135	98,496	202.1	0.0	823	207
23/7/03 - 4/8/03	10	0.8135	56,563	22.8	0.0	363	68
01/10/03 - 09/10/03	10	0.8135	47,650	452.5	0.0	475	70
31/12/03 - 10/1/04	10	0.8135	43,834	132.4	0.0	130	40
8/3/04 - 16/3/04	10	0.8135	52,904	146.3	0.0	348	87
18/5/02 - 22/5/02	11	0.7750	28,015	21.0	0.0	20.0	30.0
17/6/02 - 24/6/02	11	0.7750	35,299	7.7	0.0	437	127
23/12/02 - 1/1/03	11	0.7750	101,453	56.9	0.1	95	25
24/2/03 - 17/3/03	11	0.7750	187,036	119.5	0.0	180	42
15/10/03 - 22/10/03	11	0.7750	44,005	306.6	0.0	390	65
15/12/03 - 23/12/03	11	0.7750	35,486	159.1	0.0	250	50
24/3/04 - 7/4/04	11	0.7750	96,890	252.2	0.2	593	105
22/5/02 - 24/5/02	12	0.8649	22,926	16.5	0.0	20.0	30.0
12/8/02 - 14/8/02	12	0.8649	49,855	242.5	0.0	367	N/A
25/11/02 - 6/12/02	12	0.8649	135,366	98.3	0.0	135	30
30/1/03 - 24/2/03	12	0.8649	177,246	173.2	0.0	224	52
16/5/03 - 24/5/03	12	0.8649	37,635	152.0	0.0	280	55
14/6/03 - 19/6/03	12	0.8649	23,400	337.8	0.0	590	125
9/12/03 - 15/12/03	12	0.8649	45,109	193.8	0.0	283	55
13/2/04 - 25/2/04	12	0.8649	59,125	242.5	0.0	334	66
23/4/04 - 07/05/04	12	0.8649	93,102	185.8	0.0	453	105
12/7/04 - 24/7/04	12	0.8649	100,686	118.1	0.0	N/A	N/A

N/A = Not analysed

Appendix 4. A record of the number of grazings per plot for the four treatments in all grazing rotations in 2001, 2002, 2003 and 2004. Note: There are two grazings per day - one AM and one PM. Therefore, each grazing is equivalent to a half day.

D.Water	**12Blue**	36COWS	**D.Water**	**12Blue**	39COWS
Rotation	**Grazing Period**	**Grazings**	**Rotation**	**Grazing Period**	**Grazings**
1	15/4/01(PM)-18/4/01(AM)	6	1	8/4/02(AM)-12/4/02(AM)	9
2	13/5/01(PM)-17/5/01(AM)	8	2	14/5/02(PM)-16/5/02(PM)	5
3	14/6/01(AM)-17/6/01(AM)	7	2	17/5/02(PM)	1
4	10/7/01(PM)-12/7/01(PM)	5	3	13/6/02(AM)	1
5	3/8/01(AM)-5/8/01(PM)	6	3	14/6/02(PM)	1
6	16/9/01(PM)-21/9/01(AM)	10	3	15/6/02(AM + PM)	2
7	15/11/01(PM)-18/11/01(PM)	6	3	16/6/02(PM)	1
			4	8/7/02(PM)	1
D.Water	**11Blue**		4	9/7/02(PM)	1
1	4/4/01(PM)-6/4/01(PM)	4	4	10/7/02(AM)-11/7/02(PM)	3
2	4/7/01(PM)-5/7/01(AM)	2	5	7/8/02(PM)	1
3	7/8/01(PM)-9/8/01(AM)	4	5	8/8/02(PM)-9/8/02(PM)	3
4	9/9/01(PM)-12/9/01(AM)	6	5	10/8/02(PM)	1
5	2/11/01(PM)-5/11/01(AM)	6	6	17/9/02(AM)	1
			6	18/9/02(AM)-19/9/02(PM)	4
D.Water	**10Blue**		6	20/9/02(PM)	1
1	25/5/01(PM)-28/5/01(AM)	6	7	5/11/02(AM + PM)	2
2	1/7/01(PM)-4/7/01(AM)	6	7	7/11/02(AM)	1
3	1/8/01(AM)-2/8/01(PM)	4	7	8/11/02(AM)	1
4	21/9/01(PM)-23/9/01(PM)	5	7	9/11/02(AM)	1
	27/9/01(PM)-28/9/01(AM)	2			
5	20/11/01(AM)-20/11/01(PM)	2	**D.Water**	**11Blue**	
			1	5/4/05(AM)-7/4/02(PM)	6
2-Cut	**16Blue**		2	11/5/02(AM)-14/5/02(AM)	7
1	19/8/01(AM)-20/8/01(AM)	3	3	10/6/02(PM)	1
2	10/10/01(PM)-2/11/01(AM)	7	3	12/6/02(AM)	1
			3	13/06/02(PM)	1
2-Cut	**15Blue**		3	14/6/02(PM)	1
1	17/8/01(PM)-18/8/01(PM)	3	4	7/7/02(AM)-8/7/02(AM)	3
2	5/10/01(AM)-7/10/01(PM)	6	4	9/7/02(AM)	1
			4	10/7/02(AM)	1
2-Cut	**8Blue**		5	5/8/02(PM)-7/8/02(AM)	4
1	1/9/01(AM)-2/9/01(AM)	3	5	8/8/02 (AM)	1
	7/9/01(PM)-8/9/01(PM)	3	6	7/9/02 (AM)	1
2	30/10/01(PM)-2/11/01(AM)	6	6	8/9/02 (AM) -9/9/02 (PM)	4
			7	23/10/02 (PM)	1
			7	24/10/02 (PM)	1
			7	25/10/02 (PM)	1
			7	26/10/02 (PM)	1

Appendix 4 …continued. A record of the number of grazings per plot for the four treatments in all grazing rotations in 2001, 2002, 2003 and 2004. Note: There are two grazings per day - one AM and one PM. Therefore, each grazing is equivalent to a half day.

Grazed	**19Blue**	36COWS	**D.Water**	**10Blue**	39COWS
Rotation	**Grazing Period**	**Grazings**	**Rotation**	**Grazing Period**	**Grazings**
1	10/4/01 (AM)---12/4/01 (AM)	5	1	SILAGE 24/4/02	
2	7/5/01 (AM)---9/5/01 (PM)	6	2	22/5/02 (PM)	1
3	6/6/01 (PM)---10/6/01 (PM)	9	2	23/5/02 (PM)	1
4	5/7/01 (PM)---7/7/01 (AM)	4	2	24/5/02 (PM)	1
5	30/7/01 (PM)---31/7/01 (PM)	3	2	25/5/02 (PM)	1
6	12/9/01 (PM)---16/9/01 (AM)	8	3	22/6/02 (PM)	1
7	8/11/01 (PM)---11/11/01 (AM)	6	3	23/6/02 (PM)	1
			3	24/6/02 (AM)	1
Grazed	**17Blue**		3	25/6/02 (AM)	1
1	7/4/01 (AM)---8/4/01 (PM)	4	3	26/6/02 (PM)	1
2	4/5/01 (AM)---6/5/01 (PM)	6	4	SILAGE 27/7/02	
3	2/6/01 (AM)---6/6/01 (AM)	9	5	4/9/02 (AM)	1
4	7/7/01 (PM)---9/7/01 (PM)	5	5	5/9/02 (AM)	1
5	6/8/01 (AM)---7/8/01 (PM)	3	5	6/9/02 (AM +PM)	2
6	24/9/01 (AM)---27/9/01 (AM)	7	5	7/9/02 (PM)	1
7	13/11/01 (AM)--15/11/01 (AM)	5	6	18/10/02 (PM)	1
			6	19/10/02 (PM)	1
Grazed	**13Blue**		6	20/10/02 (PM)	1
1	13/4/01 (AM)---14/4/01 (AM)	3	6	21/10/02 (PM)	1
2	10/5/01 (AM)---11/5/01 (AM)	3	6	22/10/02 (PM)	1
3	10/6/01 (PM)---11/6/01 (PM)	3			
4	14/7/01 (PM)---15/7/01 (PM)	3	**2-Cut**	**16Blue**	
5	11/8/01 (PM)---12/8/01 (PM)	3	1	13/2/02(AM)-17/2/02(AM)	5
6	28/9/01 (PM)---30/9/01 (AM)	4	2	3/4/02 (PM)	1
7	11/11/01 (PM)--12/11/01(PM)	3	3	1st CUT SILAGE 5/6/02	
			4	2nd CUT SILAGE 27/7/02	
1-Cut	**3Blue**		5	21/8/02 (AM)	1
1	30/4/01 (PM)---3/5/01 (PM)	7	5	22/08/02 (AM + PM)	2
2	19/6/01 (PM)---22/6/01 (AM)	6	6	4/10/02 (AM)	1
3	19/7/01 (PM)---21/7/01 (AM)	4	6	5/10/02 (AM)	1
4	20/8/01 (PM)---21/8/01 (PM)	3	6	6/10/02 (AM +PM)	2
5	15/10/01 (PM)--21/10/01(AM)	6	7	15/11/02 (AM) 117 cows*	1
1-Cut	**5Blue**				
Rotation	Grazing Period	Grazings			
1	22/6/01 (PM)---24/6/01 (AM)	4			
2	23/7/01 (PM)---25/7/01 (PM)	5			
3	2/9/01 (PM)---4/9/01 (PM)	5			
4	23/10/01 (PM)--25/10/01 (PM)	5			

Appendix 4 …continued. A record of the number of grazings per plot for the four treatments in all grazing rotations in 2001, 2002, 2003 and 2004. Note: There are two grazings per day - one AM and one PM. Therefore, each grazing is equivalent to a half day.

1-Cut	**6Blue**	36COWS	**2-Cut**	**15Blue**	39COWS
Rotation	**Grazing Period**	**Grazings**	**Rotation**	**Grazing Period**	**Grazings**
1	25/6/01 (AM)---27/6/01 (PM)	6	1	26/2/02 (AM)	1
2	26/7/01 (AM)---28/7/01 (AM)	5	1	1/3/02 (AM) - 3/3/02 (AM)	3
3	5/9/01 (AM)---7/9/01 (AM)	5	2	1/4/02 (PM)	1
4	27/10/01 (PM)--30/10/01 (AM)	6	2	3/4/02 (AM)	1
			3	1st CUT SILAGE 5/6/02	
D.Water	**12Blue**		4	2nd CUT SILAGE 27/7/02	
1	14/4/04 (PM)-16/4/04(PM) 42*	5	5	19/8/02 (PM)	1
2	11/5/04 (PM)	1	5	20/8/02 (PM)	1
2	12/5/04 (PM)	1	6	1/10/02 (AM)	1
2	13/5/04 (PM)	1	6	2/10/02 (AM)- 3/10/02 (AM)	3
2	14/5/04 (PM)	1	7	12/11/02 (AM) 117*	1
3	5/6/04 (PM)	1			
3	6/6/04 (PM)- 7/6/04 (AM)	2	**2-Cut**	**8Blue**	
3	8/6/04 (AM)	1	1	26/3/02 (AM + PM)	2
4	28/6/04 (AM)- 29/6/04 (AM)	3	2	1st CUT SILAGE 5/6/02	
4	30/6/04 (AM)	1	3	2nd CUT SILAGE 27/7/02	
			4	14/9/02 (AM) -16/9/02 (PM)	6
D.Water	**11Blue**		4	17/9/02 (PM)	1
1	8/3/04 (PM) 94*	1	5	29/10/02 PM-30/10/02 PM	3
1	9/3/04 (PM) 96*	1	5	31/10/02 (PM)	1
2	25/4/04 (AM) 42*	1			
2	26/4/04 (PM)-27/4/04 (PM)	3	**Grazed**	**19Blue**	
2	28/4/04 (PM)	1	1	21/4/02 (PM)	1
3	19/5/04 (PM)	1	1	22/4/02 (PM)-24/4/02 (PM)	5
3	20/5/04 (PM)	1	1	25/4/02 (PM)	1
3	21/5/04 (PM)	1	2	27/5/02 (PM) -28/5/02 (AM)	2
3	22/5/04 (PM)	1	2	31/5/02 (PM)	1
4	12/6/04 (AM)	1	2	2/6/02 (AM)	1
4	13/6/04 (AM+PM)	2	2	3/6/02 (AM)	1
5	4/7/04 (PM)	1	2	4/6/02 (AM)	1
5	5/7/04 (PM)	1	3	26/6/02(AM)	1
5	7/7/04 (PM)	1	3	27/6/02 (AM) -28/6/02 (AM)	3
			4	25/7/02 (AM)	1
D.Water	**10Blue**		4	26/7/02 (PM)	1
1	25/2/04(AM) 78*	1	4	27/7/02 (AM) - 28/7/02 AM)	3
1	26/2/04(AM) 80*	1	5	21/8/02 (PM)	1
1	27/2/04(AM) 81*	1	5	23/8/02 (AM)- 24/8/02 (PM)	4
2	21/4/04(PM)-22/4/04 (PM) 42*	3	6	9/10/02 (AM)	1
2	23/4/04 (PM)	1	6	10/10/02 (AM)	1
3	18/5/04 (AM)-19/5/04 (AM)	3	6	11/10/02 (AM + PM)	2
3	20/5/04 (AM)	1	6	12/10/02 (PM)	1
3	21/5/04 (AM)	1	7	16/11/02 (AM) 117 *	1
4	9/6/04 (AM)	1			
4	10/6/04 (AM)	1			
4	11/6/04 (PM)	1			
5	3/7/04 (AM) - 4/7/04 (AM)	3			

Appendix 4 …continued. A record of the number of grazings per plot for the four treatments in all grazing rotations in 2001, 2002, 2003 and 2004. Note: There are two grazings per day - one AM and one PM.

2-Cut	**16Blue**		**Grazed**	**17Blue**	39 Cows
Rotation	**Grazing Period**	**Grazings**	**Rotation**	**Grazing Period**	**Grazings**
1	26/3/04(PM) 110*	1	1	17/4/02 (PM) -21/4/02 (AM)	8
1	27/3/04(PM) 112*	1	1	22/4/02 (AM)	1
2	22/5/04 Silage cut		2	20/5/02 (AM)	1
			2	21/5/02 (AM)	1
2-Cut	**15Blue**		2	22/5/02 (AM)	1
1	30/3/04 (PM) 23*	1	2	23/5/02 (AM)	1
1	31/3/04 (AM) 115*	1	2	24/5/02 (AM)	1
1	1/4/04 (AM) 115*	1	3	18/6/02 (PM)	1
2	22/5/04 Silage cut		3	19/6/02 (PM)	1
			3	20/6/02 (PM)	1
2-Cut	**8Blue**		3	21/6/02 (PM)	1
1	24/3/04(AM) 49*	1	4	18/7/02 (PM)	1
1	25/3/04(AM) 109*	1	4	19/7/02 (PM)	1
1	29/3/04(AM) 113*	1	4	20/7/02 (PM)	1
2	22/5/04 Silage cut		4	21/7/02 (PM)	1
			4	22/7/02 (PM)	1
Grazed	**19Blue**		5	17/8/02 (PM)-19/8/02 (AM)	4
1	7/4/04 (AM) 42*	1	5	20/8/02 (AM)	1
1	8/4/04 (AM + PM)	2	6	29/9/02 (AM)-30/9/02 (PM)	4
1	9/4/04 (PM)	1	6	1/10/02 (PM)	1
1	10/4/04 (PM)	1	7	6/11/02 (AM + PM)	2
1	12/4/04 (AM)	1	7	7/11/02 (PM)	1
2	5/5/04 (PM) - 7/5/04 (AM)	4	7	8/11/02 (PM)	1
3	28/5/04 (AM)	1			
3	29/5/04 (AM)-30/5/04 (AM)	3	**Grazed**	**13Blue**	
4	17/6/04 (PM)	1	1	25/4/02 (AM)	1
4	18/6/04 (PM)	1	1	26/4/02 (AM) -27/4/02 (AM)	3
4	19/6/04 (PM)	1	1	28/4/02 (AM)	1
5	12/7/04 (PM)	1	2	31/5/02 (AM)	1
5	13/7/04 (PM)	1	2	1/6/02 (AM)	1
5	14/7/04 (PM)	1	3	29/6/02 (PM)	1
			3	1/7/02 (PM)	1
Grazed	**17Blue**		4	1/8/02 (AM)	1
1	5/4/04 (AM)- 6/4/04(PM) 42*	4	4	2/8/02 (AM + PM)	2
1	7/4/04 (PM)	1	5	27/8/02 (PM)	1
2	3/5/04 (AM) - 5/5/04 (AM)	5	5	28/8/02 (PM)	1
3	26/5/04 (PM) - 27/5/04 (PM)	3	6	12/10/02 (AM)	1
3	28/5/04 (PM)	1	6	13/10/02 (AM)	1
4	20/6/04 (AM)	1	6	14/10/02 (AM)	1
4	21/6/04 (AM)	1			
4	22/6/04 (AM)	1			
4	23/6/04 (PM)	1			
5	10/7/04 (PM)	1			
5	11/7/04 (AM) - 12/7/04 (AM)	3			

Appendix 4 …continued. A record of the number of grazings per plot for the four treatments in all grazing rotations in 2001, 2002, 2003 and 2004. Note: There are two grazings per day - one AM and one PM.

Grazed	**13Blue**		**1-Cut**	**3 BLUE**	**39 Cows**
Rotation	**Grazing Period**	**Grazings**	**Rotation**	**Grazing Period**	**Grazings**
1	3/4/04 (PM)-4/4/04 (PM) 42*	3	1	16/3/02 (AM) -18/3/02 (AM)	5
2	1/5/04 (AM)	1	2	1st CUT SILAGE 5/6/02	
2	2/5/04 (AM+PM)	2	3	19/7/02 (AM)	1
3	24/5/04 (PM)	1	3	20/7/02 (AM)	1
3	25/5/04 (PM)	1	3	21/7/02 (AM)	1
4	15/6/04 (PM)	1	3	22/7/02 (AM)	1
4	16/6/04 (PM)	1	3	23/7/02 (PM)	1
5	9/7/04 (PM)	1	4	14/08/02 (PM)	1
5	10/7/04 (PM)	1	4	15/08/02 (PM)	1
			4	16/08/02 (PM)	1
1-Cut	**3 BLUE**		4	17/08/02 (AM)	1
1	7/3/04 (AM) 93*	1	5	24/9/02 (AM)	1
1	8/3/04 (AM) 94*	1	5	25/9/02 (AM)	1
1	9/3/04 (AM) 50*	1	5	26/9/02 (AM) -27/9/02 (AM)	3
2	26/3/04 (AM) 110*	1	6	3/11/02 (AM)	1
3	22/5/04 Silage cut		6	4/11/02 (AM + PM)	2
4	17/6/04 (AM) 42*	1			
4	18/6/04 (AM)	1	**1-Cut**	**5 BLUE**	
4	19/6/04 (AM)	1	1	22/3/02 (AM) -23/3/02 (AM)	3
5	13/7/04 (AM)	1	2	1st CUT SILAGE 5/6/02	
5	14/7/04 (AM)	1	3	12/7/02 (AM)	1
5	15/7/04 (AM+PM)	2	3	13/7/02 (AM)	1
			3	14/7/02 (AM)	1
1-Cut	**5 BLUE**		4	10/8/02 (AM)	1
1	13/3/04(PM) 105*	1	4	11/8/02 (AM) - 12/8/02	4
1	14/3/04(PM) 105*	1	5	20/9/02 (AM)	1
2	22/5/04 Silage cut		5	21/9/02 (AM) -22/9/02 (PM)	4
3	20/6/04 (PM) 42*	1	6	31/10/02 (AM)	1
3	21/6/04 (PM)	1	6	1/11/02 (AM + PM)	2
3	22/6/04 (PM)	1			
4	16/7/04 (AM) - 17/7/04 (PM)	4	**1-CUT**	**6 BLUE**	
			1	23/3/02 (PM) - 24/3/02(PM)	3
1-CUT	**6 BLUE**		1	25/3/02 (PM)	1
1	16/3/04(AM) 106*	1	2	1st CUT SILAGE 5/6/02	
1	17/3/04(AM) 106*	1	3	15/7/02 (AM)	1
1	18/3/04(PM) 41*	1	3	16/7/02 (AM)	1
2	22/5/04 Silage cut		3	17/7/02 (PM) -18/7/02 (AM)	2
3	24/6/04 (PM) 42*	1	4	13/8/02 (AM) -14/8/02 (AM)	3
3	25/6/04 (PM)	1	4	15/8/02 (AM)	1
3	26/6/04 (PM)	1	4	16/8/02 (AM)	1
4	18/7/04 (AM)- 19/7/04 (PM)	4	5	23/9/02 (AM + PM)	2
			5	24/9/02 (PM)	1
			5	25/9/02 (PM)	1
			6	2/11/02 (AM + PM)	2
			6	3/11/02 (PM)	1

Appendix 4 …continued. A record of the number of grazings per plot for the four treatments in all grazing rotations in 2001, 2002, 2003 and 2004. Note: There are two grazings per day - one AM and one PM.

D.Water	12Blue		Grazed	19Blue	
Rotation	Grazing Period	Grazings	Rotation	Grazing Period	Grazings
1	31/3/03(AM) 108* (PM) 48*	2	1	13/4/03 (PM) 77*	1
2	1/5/03 (AM) - 3/5/03(AM) 39*	5	1	14/4/03(PM) 112*	1
3	29/5/03 (AM)	1	1	15/4/03(AM) 17*	1
3	30/5/03 (AM) - 31/5/03 (PM)	4	2	11/5/03(AM) 39*	1
4	25/6/03 (PM)	1	2	12/5/02 (AM + PM)	2
4	26/6/03 (PM)	1	2	13/5/03 (PM)	1
4	27/6/03 (PM)	1	3	8/6/03 (PM)	1
4	28/6/03 (PM)	1	3	9/6/03 (PM)	1
4	29/6/03 (PM)	1	3	10/6/03 (PM)	1
5	23/7/03 (PM)	1	3	11/6/03 (PM)	1
5	24/7/03 (PM)	1	4	9/7/03 (PM)	1
5	25/7/03 (PM)	1	4	10/7/03 (PM)	1
5	26/7/03 (PM)	1	4	11/7/03 (PM)	1
5	27/7/03 (PM)	1	4	12/7/03 (AM + PM)	2
6	26/8/03 (PM) - 28/8/03 (AM)	4	5	5/8/03 (PM)	1
6	29/8/03 (AM)	1	5	6/8/03 (PM)	1
7	1/10/03 (PM) – 2/10/03 (PM)	3	5	7/8/03 (PM) - 8/8/03 (AM)	2
7	3/10/03 (PM)	1	5	9/8/03 (PM)	1
8	12/11/03 (PM)	1	6	12/9/03 (AM)	1
8	13/11/03 (PM)	1	6	13/9/03 (AM)	1
8	15/11/03 (AM)	1	6	14/9/03 (AM)	1
			6	15/9/03 (AM)	1
D.Water	**11Blue**		7	18/10/03 (AM)	1
1	21/2/03 (AM) 29*	1	7	19/10/03 (AM)	1
1	22/2/03 (AM) 69*	1	7	20/10/03 (AM+PM)	2
1	23/2/03 (AM) 20*	1	7	21/10/03 (PM)	1
2	19/4/03 (PM)-21/4/03(PM) 39*	5			
2	22/4/03 (PM)	1	**Grazed**	**17Blue**	
2	23/4/03 (PM)	1	1	12/4/03 (AM) 35* (PM) 110*	2
3	22/5/03 (AM)	1	1	13/4/03 (AM)112* (PM) 35*	2
3	23/5/03 (AM) - 24/5/03 (PM)	4	2	9/5/03(AM)-10/5/03(PM) 39*	4
4	19/6/03 (AM)	1	2	11/5/03 (AM)	1
4	20/6/03 (AM) - 21/6/03 (PM)	4	3	6/6/03 (AM) - 8/6/03 (AM)	5
5	18/7/03 (PM)	1	4	6/7/03 (PM) - 8/7/03 (PM)	5
5	19/7/03 (PM)	1	5	3/8/03 (PM)	1
5	20/7/03 (PM)	1	5	4/8/03 (PM) - 5/8/03 (AM)	2
5	21/7/03 (PM)	1	5	6/8/03 (AM)	1
6	13/8/03 (AM)	1	5	7/8/03 (AM)	1
6	14/8/03 (AM) - 15/8/03 (PM)	3	5	8/8/03 (AM)	1
7	27/9/03 (PM)	1	6	16/9/03 (AM) - 17/9/03 (AM)	3
7	28/9/03 (PM)	1	6	18/9/03 (AM)	1
7	30/9/03 (AM) – 1/10/03 (AM)	3	6	19/9/03 (AM)	1
8	6/11/03 (PM)	1	7	23/10/03 (AM)	1
8	7/11/03 (PM)	1	7	24/10/03 (AM+PM)	2
8	8/11/03 (PM)	1	7	25/10/03 (PM)	1

Appendix 4 …continued. A record of the number of grazings per plot for the four treatments in all grazing rotations in 2001, 2002, 2003 and 2004. Note: There are two grazings per day - one AM and one PM. Therefore, each grazing is equivalent to a half day.

D.Water	10Blue		Grazed	13Blue	
Rotation	Grazing Period	Grazings	Rotation	Grazing Period	Grazings
1	26/2/03 (AM) 73*	1	1	9/4/03 (AM) 110*	1
1	27/2/03 (AM) 30*	1	2	14/5/03(PM) 39*	1
2	22/4/03 (AM) 39*	1	2	15/5/03 (PM)	1
2	23/4/03 (AM)	1	3	9/6/03 (AM)	1
2	24/4/03 (AM) - 25/4/03 (PM)	4	3	10/6/03 (AM)	1
3	18/5/03 (PM)	1	3	11/6/03 (AM)	1
3	20/5/03 (AM) - 21/5/03 (AM)	3	4	9/7/03 (AM)	1
4	17/6/03 (AM) - 18/6/03 (PM)	4	4	10/7/03 (AM)	1
4	19/6/03 (PM)	1	4	11/7/03 (AM)	1
5	17/7/03 (AM)	1	5	10/8/03 (AM)	1
5	18/7/03 (AM)	1	5	11/8/03 (AM)	1
5	19/7/03 (AM)	1	6	14/9/03 (PM)	1
5	20/7/03 (AM)	1	6	15/9/03 (PM)	1
5	21/7/03 (AM)	1	7	26/10/03 (PM)	1
5	22/7/03 (AM)	1	7	27/10/03 (PM)	1
6	15/8/03 (PM) - 16/8/03 (PM)	3			
6	17/8/03 (PM)	1	**1-Cut**	**3BLUE**	
7	18/9/03 (PM)	1	1	6/3/03 (AM) 73*	1
7	19/9/03 (PM)	1	1	7/3/03 (AM) 26*	1
7	20/9/03 (PM)	1	2	1st CUT SILAGE 24/5/03	
8	28/10/03 (PM)	1	3	1/7/03(PM) 39*	1
8	29/10/03 (PM)	1	3	2/7/03 (PM)	1
8	30/10/03 (PM)	1	3	3/7/03 (AM)	1
			3	4/7/03 (AM)	1
2-Cut	**16Blue**		3	5/7/03 (AM)	1
1	26/3/03 (AM) 105*	1	4	30/7/03 (AM)-31/7/03 (PM)	3
2	1st CUT SILAGE 24/5/03		4	1/8/03 (PM)	1
3	2nd CUT SILAGE 21/7/03		5	1/9/03 (PM) - 2/9/03 (AM)	2
4	23/8/03 (PM) 39*	1	5	3/9/03 (AM)	1
4	24/8/03 (PM)	1	5	4/9/03 (AM)	1
5	23/9/03 (AM)	1	5	5/9/03 (AM)	1
5	24/9/03 (AM + PM)	2	6	9/10/03 (AM)	1
6	30/10/03 (AM)	1	6	10/10/03(AM)-11/10/03(AM)	3
6	31/10/03 (AM)	1	7	11/11/03 (PM)	1
6	1/11/03 (AM)	1	7	13/11/03 (AM)	1
			7	14/11/03 (AM)	1

Appendix 4 …continued. A record of the number of grazings per plot for the four treatments in all grazing rotations in 2001, 2002, 2003 and 2004. Note: There are two grazings per day - one AM and one PM. Therefore, each grazing is equivalent to a half day.

2-Cut	**15 Blue**		**1-Cut**	**5 BLUE**	
Rotation	**Grazing Period**	**Grazings**	**Rotation**	**Grazing Period**	**Grazings**
1	28/3/03 (AM) 107*	1	1	10/3/03 (AM) 87*	1
2	1st CUT SILAGE 24/5/03		1	11/3/03 (AM) 42*	1
3	2nd CUT SILAGE 21/7/03		2	1st CUT SILAGE 24/5/03	
4	17/8/03 (AM) 39*	1	3	28/6/03 (AM) 39*	1
4	18/8/03 (AM)	1	3	29/6/03 (AM)	1
5	25/9/03 (AM)	1	3	30/6/03 (AM) - 1/7/03 (AM)	3
5	26/9/03 (AM + PM)	2	4	28/7/03 (AM) - 30/7/03 (AM)	5
6	2/11/03 (AM)	1	5	23/8/03 (AM)	1
6	3/11/03 (AM)	1	5	24/8/03 (AM)	1
6	4/11/03 (AM)	1	5	25/8/03 (AM) - 26/8/03 (AM)	3
			6	5/10/03 (PM)	1
2-Cut6	**8 Blue**		6	6/10/03 (PM) - 7/10/03 (PM)	3
1	17/3/03 (PM) 33*	1	7	9/11/03 (AM+PM)	2
1	18/3/03 (AM) 55* (PM) 54*	2	7	10/11/03 (PM)	1
1	19/3/03 (AM) 65* (PM) 78*	2			
2	1st CUT SILAGE 24/5/03		**1-CUT**	**6 BLUE**	
3	2nd CUT SILAGE 21/7/03		1	13/3/03 (AM) 88*	1
4	6/9/03 (AM) 39*	1	1	14/3/03 (AM) 48*	1
4	7/9/03 (AM)	1	2	1st CUT SILAGE 24/5/03	
4	8/9/03 (AM) - 10/9/03 (PM)	6	3	24/6/03 (AM) 39*	1
5	15/10/03 (PM)	1	3	25/6/03 (AM)	1
5	16/10/03 (PM)	1	3	26/6/03 (AM)	1
5	17/10/03 (PM)	1	3	27/6/03 (AM)	1
5	18/10/03 (PM)	1	4	22/7/03 (PM) - 23/7/03 (AM)	2
5	19/10/03 (PM)	1	4	24/7/03 (AM)	1
6	29/11/03 (AM) 96*	1	4	25/7/03 (AM)	1
6	30/11/03 (AM) 96*	1	4	26/7/03 (AM)	1
			4	27/7/03 (AM)	1
			5	20/8/03 (AM) -21/8/03 (AM)	3
			5	22/8/03 (AM)	1
			6	3/10/03 (AM)	1
			6	4/10/03 (AM) - 5/10/03 (AM)	3
			6	6/10/03 (AM)	1
			7	5/11/03 (PM)	1
			7	7/11/03 (AM)	1
			7	8/11/03 (AM)	1

Appendix 5. A summary of the herbage-on-offer (i.e. the grass DM available to the grazing animals prior to grazing) data for each plot for the four treatments in almost all grazing rotations in 2001, 2002, 2003 and 2004.

Plot	Date	DM	Cr.Prt	%N	N	Plot	Date	DM	Cr.Prt	%N	N
DW		kg/ha	g/kg		**kg/ha**	**DW**		kg/ha	g/kg		**kg/ha**
12	14/05/2001	3612	193	3.1	111.5	12	04/04/2002	2709	205	3.3	88.7
12	12/06/2001	4044	144	2.3	93.4	12	14/05/2002	3802	213	3.4	129.6
12	10/07/2001	3290	177	2.8	93.3	12	13/06/2002	3140	144	2.3	72.4
12	02/08/2001	2955	167	2.7	79.0	12	05/07/2002	2447	183	2.9	71.8
12	13/09/2001	5813	138	2.2	128.2	12	06/08/2002	2686	178	2.8	76.3
12	12/11/2001	2407	225	3.6	86.5	12	17/09/2002	4181	156	2.5	104.2
DW						12	05/11/2002	2009	207	3.3	66.6
11	05/07/2001	5283	139	2.2	117.7						
11	08/08/2001	2231	174	2.8	62.0	**DW**	03/04/2002	2881	205	3.3	94.3
11	07/09/2001	3345	156	2.5	83.3	11	09/05/2002	3765	155	2.5	93.1
11	31/10/2001	2406	207	3.3	79.8	11	12/05/2002	2935	144	2.3	67.7
DW						11	05/07/2002	2552	183	2.9	74.8
10	25/05/2001	3272	167	2.7	88.4	11	02/08/2002	3567	160	2.6	91.5
10	02/07/2001	4084	139	2.2	91.0	11	06/09/2002	3059	143	2.3	70.1
10	01/08/2001	2626	167	2.7	70.2	11	24/10/2002	3105	191	3.0	94.7
10	24/09/2001	4811	134	2.1	103.1	11					
10	16/11/2001	1694	225	3.6	60.9	**DW**	22/05/2002	1942	185	3.0	57.5
2CUT						10	21/06/2002	2031	168	2.7	54.6
16	17/08/2001	1459	177	2.8	41.4	10	03/09/2002	3347	143	2.3	76.7
16	09/10/2001	3633	146	2.3	84.9	10	17/10/2002	2686	182	2.9	78.0
2CUT						10					
15	17/08/2001	1502	177	2.8	42.6	**2CUT**	21/08/2002	1658	182	2.9	48.2
15	02/10/2001	4443	166	2.7	118.2	16	04/10/2002	2418	155	2.5	59.9
2CUT						16	13/11/2002	637	195	3.1	19.9
8	07/09/2001	3016	156	2.5	75.1	16					
8	31/10/2001	2351	207	3.3	78.0	**2CUT**	19/08/2002	1441	182	2.9	41.9
GRAZED						15	30/09/2002	2651	155	2.5	65.7
19	09/05/2001	2081	179	2.9	59.6	15	11/11/2002	595	195	3.1	18.5
19	08/06/2001	4593	153	2.4	112.3	15					
19	06/07/2001	2350	139	2.2	52.3	**2CUT**	21/03/2002	2124	185	3.0	63.0
19	30/07/2001	2197	167	2.7	58.7	8	13/09/2002	3215	120	1.9	61.7
19	12/09/2001	4996	138	2.2	110.2	8	28/10/2002	1178	196	3.1	36.9
19	07/11/2001	2351	218	3.5	82.1	**GRAZED**					
GRAZED						19	22/04/2002	3000	176	2.8	84.6
17	09/05/2001	2162	179	2.9	61.9	19	27/05/2002	3439	155	2.5	85.3
17	01/06/2001	3284	153	2.4	80.3	19	26/06/2002	2487	163	2.6	64.7
17	06/07/2001	2084	139	2.2	46.4	19	25/07/2002	4192	139	2.2	93.4
17	03/08/2001	2557	167	2.7	68.4	19	22/08/2002	3381	182	2.9	98.3
17	20/09/2001	5195	129	2.1	106.8	19	07/10/2002	3241	153	2.5	79.5
17	09/11/2001	1929	218	3.5	67.4	19	13/11/2002	796	195	3.1	24.8

Cr. Prt =Crude protein on a 100% DM basis

Appendix 5 ..continued . A summary of the herbage-on-offer (i.e. the grass DM available to the grazing animals prio data for each plot for the four treatments in almost all grazing rotations in 2001, 2002, 2003 and 2004.

Plot	Date	DM	Cr.Prt	%N	N	Plot	Date	DM	Cr.Prt	%N	N
GRAZED		kg/ha	g/kg		**kg/ha**	**GRAZED**		kg/ha	g/kg		**kg/ha**
13	09/05/2001	2263	179	2.9	64.8	17	11/04/2002	3268	178	2.8	92.8
13	08/06/2001	4442	153	2.4	108.6	17	21/05/2002	2840	185	3.0	84.1
13	11/07/2001	3338	177	2.8	94.6	17	13/06/2002	2413	144	2.3	55.6
13	10/08/2001	2377	174	2.8	66.1	17	19/07/2002	3060	128	2.1	62.8
13	27/09/2001	4263	134	2.1	91.3	17	16/08/2002	2520	178	2.8	71.8
13	08/11/2001	1967	218	3.5	68.7	17	27/09/2002	4289	155	2.5	106.3
1 CUT						17	07/11/2002	1589	207	3.3	52.7
3	20/06/2001	2495	150	2.4	59.9	**GRAZED**					
3	19/07/2001	3522	147	2.4	83.1	13	25/04/2002	3665	176	2.8	103.4
3	20/08/2001	1944	159	2.5	49.5	13	30/05/2002	3718	155	2.5	92.3
3	12/10/2001	3457	146	2.3	80.7	13	28/06/2002	3168	163	2.6	82.4
1 CUT						13	01/08/2002	3764	160	2.6	96.6
5	22/06/2001	2031	150	2.4	48.7	13	23/08/2002	2898	182	2.9	84.3
5	23/07/2001	3760	136	2.2	81.9	13	11/10/2002	2692	153	2.5	66.1
5	31/08/2001	4213	162	2.6	109.1	**1 CUT**					
5	25/10/2001	4045	181	2.9	117.1	3	17/07/2002	2479	128	2.1	50.8
1 CUT						3	15/08/2002	2387	178	2.8	68.0
6	25/06/2001	2805	136	2.2	61.1	3	25/09/2002	3184	155	2.5	78.9
6	26/07/2001	3251	136	2.2	70.8	3	01/11/2002	1141	196	3.1	35.7
6	05/09/2001	4287	156	2.5	106.7	**1 CUT**					
6	25/10/2001	2909	181	2.9	84.2	5	08/07/2002	1598	178	2.8	45.4
						5	08/08/2002	3095	178	2.8	87.9
						5	20/09/2002	2951	156	2.5	73.6
						5	30/10/2002	1633	196	3.1	51.2
						1 CUT					
						6	22/03/2002	2175	185	3.0	64.5
						6	15/07/2002	2775	128	2.1	56.9
						6	12/08/2002	2631	178	2.8	75.0
						6	23/09/2002	2528	155	2.5	62.7
						6	31/10/2002	1200	196	3.1	37.6

Cr. Prt =Crude protein on a 100% DM basis

Appendix 5 ..continued . A summary of the herbage-on-offer (i.e. the grass DM available to the grazing animals prior to grazing) data for each plot for the four treatments in almost all grazing rotations in 2001, 2002, 2003 and 2004.

Plot	Date	DM	Cr.Prt	%N	N	Plot	Date	DM	Cr.Prt	%N	N
DW		kg/ha	g/kg		**kg/ha**	**GRAZED**		kg/ha	g/kg		**kg/ha**
12	01/05/2003	2535	192.2	3.1	78.0	19	12/05/2003	2253	143.7	2.3	51.8
12	28/05/2003	2684	169.8	2.7	72.9	19	10/06/2003	3493	148.0	2.4	82.7
12	23/06/2003	3569	186.6	3.0	106.6	19	08/07/2003	3740	179.1	2.9	107.2
12	23/07/2003	2877	146.2	2.3	67.3	19	07/08/2003	3072	166.6	2.7	81.9
12	21/08/2003	3423	181.6	2.9	99.5	19	12/09/2003	2801	156.8	2.5	70.3
12	02/10/2003	2519	182	2.9	73.4	19	17/10/2003	2257	200.1	3.2	72.3
DW						**GRAZED**					
11	25/02/2003	1036	246.5	3.9	40.9	17	08/05/2003	2041	183.5	2.9	59.9
11	19/04/2003	2758	216.5	3.5	95.5	17	06/06/2003	3027	180.1	2.9	87.2
11	21/05/2003	2892	163	2.6	75.4	17	04/07/2003	3047	156.3	2.5	76.2
11	17/06/2003	2801	164	2.6	73.5	17	05/08/2003	2981	166.6	2.7	79.5
11	17/07/2003	2575	197.2	3.2	81.2	17	15/09/2003	3112	179.8	2.9	89.5
11	11/08/2003	2588	178.6	2.9	74.0	17	23/10/2003	2251	185.7	3.0	66.9
11	26/09/2003	2830	162.8	2.6	73.7	**GRAZED**					
DW						13	09/05/2003	2812	183.5	2.9	82.6
10	23/04/2003	3079	171.5	2.7	84.5	13	06/06/2003	2728	180.1	2.9	78.6
10	20/05/2003	2122	163	2.6	55.3	13	08/07/2003	4045	179.1	2.9	115.9
10	17/06/2003	3938	164	2.6	103.3	13	05/08/2003	3451	167	2.7	92.2
10	15/07/2003	3125	197.2	3.2	98.6	13	15/09/2003	3144	179.8	2.9	90.4
10	13/08/2003	3115	178.6	2.9	89.0	13	17/10/2003	2379	200.1	3.2	76.2
10	19/09/2003	2966	179.8	2.9	85.3	**1CUT**					
2CUT						3	01/07/2003	2325	156.3	2.5	58.1
16	19/08/2003	1983	181.6	2.9	57.6	3	30/07/2003	2672	196	3.1	83.8
16	24/09/2003	1805	162.8	2.6	47.0	3	29/08/2003	3181	180.6	2.9	91.9
2CUT						3	09/10/2003	2841	173.2	2.8	78.7
15	18/08/2003	1952	181.6	2.9	56.7	**1CUT**					
15	24/09/2003	2029	162.8	2.6	52.9	5	28/06/2003	2403	186.6	3.0	71.7
2CUT						5	28/07/2003	3579	196	3.1	112.2
8	13/03/2003	1717	242.9	3.9	66.7	5	21/08/2003	3087	181.6	2.9	89.7
8	03/09/2003	2643	122.4	2.0	51.8	5	03/10/2003	2487	182	2.9	72.4
8	14/10/2003	1651	200.1	3.2	52.9	**1CUT**					
						6	23/06/2003	1984	186.6	3.0	59.2
						6	23/07/2003	3527	146.2	2.3	82.5
						6	19/08/2003	2603	181.6	2.9	75.6
						6	03/10/2003	1958	182	2.9	57.0

Cr. Prt =Crude protein on a 100% DM basis.

Appendix 6: Soil carbon and nitrogen (%) and the C/N ratio data for the three plots and the ANOVA of treatment effect on % C, % N and C/N ratio.

Plot	replicate	DW % C	2 Cut % C	Grazed % C	1 Cut % C	DW C/N	2 Cut C/N	Grazed C/N	1 Cut C/N
1	1	5.94	3.37	4.81	2.84	11.00	9.63	10.02	9.47
1	2	6.40	3.29	4.08	2.85	11.64	9.40	9.49	10.56
1	3	6.75	3.07	3.48	2.99	12.98	9.03	9.94	9.34
2	1	5.72	3.42	3.88	2.78	12.43	10.06	9.95	9.93
2	2	5.35	3.11	3.90	2.92	11.89	9.42	10.54	10.07
2	3	5.54	3.19	3.37	2.94	12.31	9.11	9.11	9.19
3	1	5.11	3.57	3.39	3.44	10.02	9.92	9.16	9.83
3	2	5.91	3.20	3.45	3.08	10.02	10.32	10.15	9.63
3	3	5.32	3.24	3.14	2.92	10.23	10.13	9.24	8.85
		% N	% N	% N	% N				
1	1	0.54	0.35	0.48	0.30				
1	2	0.55	0.35	0.43	0.27				
1	3	0.52	0.34	0.35	0.32				
2	1	0.46	0.34	0.39	0.28				
2	2	0.45	0.33	0.37	0.29				
2	3	0.45	0.35	0.37	0.32				
3	1	0.51	0.36	0.37	0.35				
3	2	0.59	0.31	0.34	0.32				
3	3	0.52	0.32	0.34	0.33				

Appendix 6…continued: ANOVA of treatment effect on % C, % N and C/N ratio.

Anova: Two-Factor without Replication - %C

Summary	*Count*	*Sum*	*Average*	*Variance*
Sub-plot 1*	4	16.96	4.24	1.9773
Sub-plot 2	4	16.62	4.155	2.499
Sub-plot 3	4	16.29	4.0725	3.2323
Sub-plot 4	4	15.8	3.95	1.5959
Sub-plot 5	4	15.28	3.82	1.2205
Sub-plot 6	4	15.04	3.76	1.4393
Sub-plot 7	4	15.51	3.8775	0.6809
Sub-plot 8	4	15.64	3.91	1.8015
Sub-plot 9	4	14.62	3.655	1.25
Dirty water	9	52.04	5.7822	0.2843
2-cut silage	9	29.46	3.2733	0.0251
Grazed	9	33.5	3.7222	0.2592
1-cut silage	9	26.76	2.9733	0.0383

* In this analysis sub-plot = 1/3 area of each replicate plot for the 4 treatments.

ANOVA - %C

Source	*SS*	*Df*	*MS*	*F*	*P-value*
Sub-plots	1.147	8	0.1433	0.9275	0.512
Treatments	43.381	3	14.46	93.573	<0.001
Error	3.701	24	0.1545		
Total	48.236	35			

Appendix 6…continued. Anova: Two-Factor Without Replication - % Total N

Summary	*Count*	*Sum*	*Average*	*Variance*
Sub-plot 1	4	1.67	0.42	0.012425
Sub-plot 2	4	1.6	0.40	0.014267
Sub-plot 3	4	1.53	0.38	0.008558
Sub-plot 4	4	1.47	0.37	0.005825
Sub-plot 5	4	1.44	0.36	0.004667
Sub-plot 6	4	1.49	0.37	0.003092
Sub-plot 7	4	1.59	0.40	0.005692
Sub-plot 8	4	1.56	0.39	0.017933
Sub-plot 9	4	1.51	0.38	0.009092
Dirty water	9	4.59	0.51	0.00235
2-cut silage	9	3.05	0.34	0.000261
Grazed	9	3.44	0.38	0.002119
1-cut silage	9	2.78	0.31	0.000661

ANOVA: % Total N

Source	*SS*	*Df*	*MS*	*F*	*P-value*
Sub-plots	0.01	8	0.001306	0.959204	0.489
Treatments	0.212	3	0.070656	51.88373	<0.001
Error	0.033	24	0.001362		
Total	0.255	35			

Appendix 6…continued. Anova: Two-Factor without Replication – C/N

SUMMARY	*Count*	*Sum*	*Average*	*Variance*
Sub-plot 1	4	40.12	10.03	0.47
Sub-plot 2	4	41.08	10.27	1.11
Sub-plot 3	4	41.30	10.32	3.28
Sub-plot 4	4	42.37	10.59	1.51
Sub-plot 5	4	41.92	10.48	1.09
Sub-plot 6	4	39.72	9.93	2.52
Sub-plot 7	4	38.93	9.73	0.15
Sub-plot 8	4	40.11	10.03	0.09
Sub-plot 9	4	38.44	9.61	0.46
Dirty water	9	102.52	11.39	1.25
2-cut silage	9	87.02	9.67	0.21
Grazed	9	87.59	9.73	0.25
1-cut silage	9	86.85	9.65	0.26

ANOVA: C/N

Source	*SS*	*Df*	*MS*	*F*	*P-value*
Sub-plots	3.52	8	0.440351	0.857419	0.564
Treatments	19.7	3	6.567959	12.78863	<0.001
Error	12.33	24	0.513578		
Total	35.55	35			

Appendix 7: Effect of treatment (Dirty water = 1; 2-Cut = 2; Grazed = 3; 1-Cut = 4) on NO_3-N concentrations (mg/l) for each cup and all treatments in the drainage year October 2001 to June 2002; Effective rainfall (mm/week) (Concentrations in red > MAC; ns = no sample).

Cup	Treatment	24/10/01	31/10/01	07/11/01	14/11/01	21/11/01	28/11/01	05/12/01	12/12/01	19/12/01	26/12/01	02/01/02
1	1	ns	ns	0.42	0.36	0.55	ns	1.73	ns	ns	ns	ns
2	1	3.29	3.83	4.51	7.05	ns	ns	9.59	7.09	8.52	9.29	9.87
3	1	2.58	2.31	ns	5.18	5.74	6.07	6.86	7.70	8.25	9.92	9.95
4	1	7.42	8.80	8.26	9.40	9.06	9.10	9.55	7.43	9.33	9.23	0.01
5	1	ns	54.77	ns	46.86	45.20	46.12	48.62	50.14	38.03	37.00	28.59
6	1	ns	28.34	24.02	21.96	24.18	ns	21.86	ns	1.61	ns	ns
7	1	7.71	6.70	6.61	8.69	8.79	8.74	9.21	7.47	10.40	10.57	10.52
8	1	0.99	2.53	3.40	6.38	8.22	8.44	9.21	9.66	9.56	8.04	9.24
	Mean	**4.40**	**15.33**	**7.87**	**13.24**	**14.53**	**15.69**	**14.58**	**14.92**	**12.24**	**14.01**	**11.36**
9	1	4.67	4.70	ns	3.29	3.64	4.11	5.11	6.28	4.96	5.27	5.18
10	1	7.02	8.91	6.72	7.00	7.00	6.80	7.60	9.17	7.83	7.75	7.47
11	1	35.00	28.07	23.16	22.43	18.67	16.37	16.81	16.53	17.50	17.28	19.18
12	1	ns	ns	ns	7.11	6.38	6.44	6.85	7.62	7.01	8.09	8.07
13	1	ns	1.44	1.37	3.60	3.47	2.98	3.01	3.55	3.31	3.86	4.14
14	1	ns	ns	ns	15.43	11.67	13.45	11.98	ns	ns	ns	ns
15	1	16.95	15.44	4.86	12.07	10.83	11.36	12.33	13.96	13.49	14.35	15.72
16	1	6.87	19.19	60.36	131.10	125.45	129.44	126.43	82.53	43.08	55.78	78.06
	Mean	**14.10**	**12.96**	**19.29**	**25.25**	**23.39**	**23.87**	**23.77**	**19.95**	**13.88**	**16.05**	**19.69**
17	1	115.43	74.76	67.92	48.29	41.07	40.64	42.05	23.07	18.49	18.33	20.22
18	1	6.94	5.06	ns	5.71	5.80	5.25	0.73	5.81	5.39	5.11	4.69
19	1	4.49	5.04	4.39	4.21	3.97	4.05	3.91	3.61	3.49	3.58	3.46
20	1	0.38	ns	1.01	0.93	1.53	3.25	4.37	2.29	ns	4.09	5.05
21	1	0.95	0.84	0.74	0.40	0.24	0.48	0.52	1.25	1.74	2.04	1.79
22	1	1.27	0.44	0.20	0.24	0.34	0.21	0.15	0.34	0.50	0.52	0.54
23	1	ns	ns	ns	ns	ns	ns	5.80	4.47	4.26	4.47	4.44
24	1	3.71	3.25	2.52	2.24	2.16	2.65	3.69	4.02	3.25	3.11	2.92
	Mean	**19.02**	**14.90**	**12.80**	**8.86**	**7.87**	**8.08**	**7.65**	**5.61**	**5.30**	**5.16**	**5.39**
	Overall mean	**12.51**	**14.39**	**13.32**	**15.78**	**15.27**	**15.88**	**15.33**	**13.49**	**10.48**	**11.74**	**12.15**
Effective Rainfall (mm/wk)		40.50	2.24	0.34	5.66	0.00	0.00	51.14	4.04	0.00	0.00	3.23

Appendix 7…continued: Effect of treatment (Dirty water = 1; 2-Cut = 2; Grazed = 3; 1-Cut = 4) on NO_3-N concentrations (mg/l) for each cup and all treatments in the drainage year October 2001 to June 2002; Effective rainfall (mm/week) (Concentrations in red > MAC; ns = no sample).

Cup	Treatment	09/01/02	16/01/02	23/01/02	01/30/02	06/02/02	13/02/02	20/02/02	27/02/02	05/03/02	12/03/02	20/03/02
1	1	3.32	2.71	ns	ns	2.57	ns	ns	ns	ns	ns	ns
2	1	11.94	9.25	9.19	8.86	31.40	31.64	29.15	26.70	28.58	22.41	19.93
3	1	8.73	9.45	6.69	6.03	8.38	8.49	ns	ns	ns	ns	ns
4	1	8.84	8.89	8.45	12.65	13.77	13.06	8.92	8.25	16.18	4.55	6.79
5	1	34.16	39.49	44.53	45.76	64.31	56.34	30.03	8.65	19.50	9.68	3.10
6	1	62.30	84.75	ns	81.77	84.94	ns	ns	ns	35.04	ns	ns
7	1	12.98	9.67	ns	23.56	32.34	37.52	26.26	28.10	39.11	22.67	20.29
8	1	9.85	8.87	15.34	19.96	24.59	23.45	19.84	ns	24.29	ns	ns
	Mean	**19.02**	**21.64**	**16.84**	**28.37**	**32.79**	**28.42**	**22.84**	**17.93**	**27.12**	**14.83**	**12.53**
9	1	5.98	5.73	5.68	9.70	8.33	9.23	6.76	5.66	ns	ns	ns
10	1	7.33	7.54	7.78	9.83	9.57	ns	ns	ns	ns	ns	ns
11	1	19.89	24.60	28.82	28.73	41.34	45.65	ns	ns	53.43	40.08	ns
12	1	0.01	8.70	9.43	14.70	21.27	ns	ns	ns	ns	ns	ns
13	1	4.54	6.15	5.91	7.40	7.33	6.00	4.20	3.72	4.46	2.02	1.51
14	1	18.27	16.15	14.45	14.53	15.10	ns	ns	ns	ns	ns	9.52
15	1	18.73	22.18	39.98	62.78	73.01	66.59	78.72	62.59	86.24	66.58	63.51
16	1	78.20	42.96	29.23	34.49	22.06	15.76	2.89	4.00	5.25	2.77	2.60
	Mean	**19.12**	**16.75**	**17.66**	**22.77**	**24.75**	**28.65**	**23.14**	**18.99**	**37.35**	**27.86**	**19.29**
17	1	18.40	15.85	9.91	9.74	7.94	ns	ns	ns	8.46	4.78	8.39
18	1	4.59	4.30	4.36	4.89	5.10	5.63	5.07	ns	5.74	6.65	4.55
19	1	3.65	3.31	3.58	5.10	4.98	5.78	4.63	3.86	7.80	5.88	7.09
20	1	4.11	4.28	4.40	6.51	5.32	5.56	5.90	ns	11.91	ns	ns
21	1	2.52	3.81	3.96	5.42	6.17	4.41	1.86	0.67	1.61	0.26	0.23
22	1	0.86	1.21	1.37	1.62	1.97	1.13	0.51	0.25	0.94	ns	ns
23	1	4.26	4.33	6.42	0.01	ns	ns	ns	ns	ns	ns	ns
24	1	3.78	3.48	3.73	4.33	6.84	9.76	13.33	8.96	31.26	17.79	16.65
	Mean	**5.27**	**5.07**	**4.72**	**4.70**	**5.47**	**5.38**	**5.22**	**3.44**	**9.67**	**7.07**	**7.38**
	Overall mean	**14.47**	**14.49**	**13.07**	**18.61**	**21.00**	**20.81**	**17.07**	**13.45**	**24.71**	**16.59**	**13.06**
Effective Rainfall (mm/wk)		35.62	10.40	44.22	35.88	63.88	14.39	0.51	22.86	7.99	13.65	5.74

Appendix 7…continued: Effect of treatment (Dirty water = 1; 2-Cut = 2; Grazed = 3; 1-Cut = 4) on NO_3-N concentrations (mg/l) for each cup and all treatments in the drainage year October 2001 to June 2002; Effective rainfall (mm/week) (Concentrations in red > MAC; ns = no sample).

Cup	Treatment	27/03/02	03/04/02	10/04/02	16/04/02	23/04/02	01/05/02	09/05/02	14/05/02	22/05/02	29/05/02	05/06/02
1	1	0.00	0.00	ns	ns	ns	ns	ns	ns	ns	ns	ns
2	1	14.72	16.49	17.00	0.00	18.76	17.47	0.00	14.42	14.4	7.64	7.83
3	1	ns	ns	ns	ns	ns	ns	ns	ns	5.82	5.43	2.14
4	1	9.86	6.32	6.28	6.12	5.35	6.33	5.25	3.95	0.00	ns	ns
5	1	8.88	6.39	6.46	6.48	5.72	4.80	1.96	1.27	ns	0.24	0.12
6	1	ns	ns	ns	ns	ns	ns	ns	ns	2.2	0.63	0.56
7	1	7.76	9.68	13.20	ns	12.62	ns	ns	ns	ns	ns	ns
8	1	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
	Mean	**8.24**	**7.78**	**10.74**	**4.20**	**10.61**	**9.53**	**2.40**	**6.55**	**5.61**	**3.49**	**2.66**
9	1	ns	ns	ns	ns	3.00	5.02	ns	ns	ns	ns	ns
10	1	9.80	7.19	5.65	5.52	3.40	2.20	1.05	0.34	0.00	0.00	0.00
11	1	25.22	23.33	16.84	16.04	8.75	6.94	ns	ns	ns	3.03	1.5
12	1	ns	ns	19.77	ns	ns	ns	ns	ns	ns	ns	ns
13	1	0.76	1.13	0.58	1.06	1.00	1.28	0.54	0.97	1.52	0.00	1.15
14	1	0.42	ns	ns	ns	8.74	9.36	ns	ns	ns	ns	3.29
15	1	55.40	32.76	27.38	21.92	ns	ns	5.61	3.62	4.3	0.00	5.54
16	1	1.08	1.13	0.89	1.07	1.53	1.41	0.51	0.43	0.09	0.00	0.3
	Mean	**15.45**	**13.11**	**11.85**	**9.12**	**4.40**	**4.37**	**1.93**	**1.34**	**1.48**	**0.61**	**1.96**
17	1	5.18	5.62	6.67	7.19	7.74	7.50	4.12	7.14	8.07	0.00	8.1
18	1	5.31	4.34	ns	ns	ns	ns	4.94	6.01	3.54	0.00	5.1
19	1	4.10	2.69	2.04	1.59	1.03	1.57	2.5	1.25	0.02	0.00	0.01
20	1	2.14	8.07	7.48	7.32	ns	ns	ns	ns	ns	ns	ns
21	1	0.00	ns	ns	ns	ns	ns	ns	0.17	0.00	0.00	0.41
22	1	0.00	ns	ns	ns	ns	ns	ns	ns	ns	ns	0.44
23	1	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
24	1	13.20	15.47	15.22	8.89	8.41	ns	ns	ns	ns	ns	4.25
	Mean	**4.28**	**7.24**	**7.85**	**6.25**	**5.73**	**4.54**	**3.85**	**3.64**	**2.91**	**0.00**	**3.05**
	Overall mean	**9.32**	**9.37**	**10.15**	**6.52**	**6.91**	**6.15**	**2.73**	**3.84**	**3.33**	**1.36**	**2.56**
Effective Rainfall (mm/wk)		6.81	0.00	0.00	0.00	0.00	16.54	0.00	0.00	23.77	27.14	3.57

Appendix 7…continued: Effect of treatment (Dirty water = 1; 2-Cut = 2; Grazed = 3; 1-Cut = 4) on NO_3-N concentrations (mg/l) for each cup and all treatments in the drainage year October 2001 to June 2002; Effective rainfall (mm/week) (Concentrations in red > MAC; ns = no sample).

Cup	Treatment	24/10/01	31/10/01	07/11/01	14/11/01	21/11/01	28/11/01	05/12/01	12/12/01	19/12/01	26/12/01	02/01/02
25	2	0.89	ns	ns	ns	ns	ns	4.38	4.03	3.85	ns	ns
26	2	17.87	24.92	32.00	22.93	16.52	23.39	25.48	57.66	27.83	21.66	23.74
27	2	9.60	10.97	8.64	7.48	6.36	6.32	6.35	4.80	3.74	4.02	4.22
28	2	4.26	9.99	7.61	8.85	7.81	7.28	8.35	8.17	7.53	7.41	7.97
29	2	9.18	61.71	66.49	72.62	72.15	70.88	69.77	80.75	76.73	71.18	66.61
30	2	9.87	9.81	ns	21.16	17.82	16.91	14.90	20.75	28.72	ns	ns
31	2	0.06	0.28	0.18	1.02	0.04	0.01	0.01	0.01	0.24	0.01	0.01
32	2	9.50	15.66	8.96	14.86	9.62	10.23	10.24	7.66	7.91	7.89	8.78
	Mean	**7.65**	**19.05**	**20.65**	**21.27**	**18.62**	**19.29**	**17.44**	**22.98**	**19.57**	**18.70**	**18.56**
33	2	7.92	9.89	18.03	14.15	14.48	13.62	15.08	12.24	11.33	12.04	13.97
34	2	1.94	ns	4.34	ns	ns	ns	ns	ns	ns	ns	ns
35	2	ns	9.91	6.92	13.15	10.07	9.18	8.88	8.88	8.97	7.37	1.89
36	2	ns	ns	1.71	1.01	1.60	1.85	1.76	1.95	1.63	1.56	ns
37	2	1.63	3.43	3.55	6.11	6.14	6.96	8.40	7.55	9.02	7.71	9.41
38	2	0.38	1.85	0.01	0.19	0.75	0.18	0.03	0.01	0.01	0.01	0.01
39	2	6.36	6.71	6.72	5.89	5.07	4.63	4.16	3.68	2.77	2.36	2.27
40	2	2.94	6.02	6.07	7.92	7.56	7.37	7.53	7.60	7.09	8.25	8.22
	Mean	**3.53**	**6.30**	**5.92**	**6.92**	**6.52**	**6.26**	**6.55**	**5.99**	**5.83**	**5.61**	**5.96**
41	2	ns	ns	ns	0.43	0.05	7.73	0.01	0.01	0.01	0.01	0.01
42	2	ns	ns	ns	ns	ns	ns	48.48	ns	ns	ns	ns
43	2	ns	ns	ns	ns	18.21	17.38	16.19	16.27	1.05	14.07	33.62
44	2	ns	3.77	2.89	3.19	2.79	2.73	2.15	1.68	1.94	ns	ns
45	2	ns	7.21	6.73	7.00	6.62	6.33	6.28	5.95	5.52	4.76	4.37
46	2	ns	4.34	4.95	7.21	7.31	7.25	8.19	6.73	6.66	6.89	7.36
47	2	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
48	2	ns	2.90	2.14	2.11	1.49	1.38	1.47	1.62	1.51	ns	ns
	Mean	**ns**	**4.56**	**4.18**	**3.99**	**6.08**	**7.13**	**11.82**	**5.38**	**2.78**	**6.43**	**11.34**
	Overall mean	**5.59**	**9.97**	**10.25**	**10.73**	**10.41**	**10.89**	**11.94**	**11.45**	**9.39**	**10.25**	**11.95**
Effective Rainfall (mm/wk)		40.50	2.24	0.34	5.66	0.00	0.00	51.14	4.04	0.00	0.00	3.23

Appendix 7…continued: Effect of treatment (Dirty water = 1; 2-Cut = 2; Grazed = 3; 1-Cut = 4) on NO_3-N concentrations (mg/l) for each cup and all treatments in the drainage year October 2001 to June 2002; Effective rainfall (mm/week) (Concentrations in red > MAC; ns = no sample).

Cup	Treatment	09/01/02	16/01/02	23/01/02	01/30/02	06/02/02	13/02/02	20/02/02	27/02/02	05/03/02	12/03/02	20/03/02
25	2	5.22	5.07	5.05	3.92	20.27	ns	ns	ns	ns	ns	ns
26	2	24.45	22.70	26.42	27.25	13.31	4.56	ns	ns	0.00	42.74	42.52
27	2	3.60	3.14	3.23	2.75	5.05	14.34	14.68	13.84	17.86	1.91	2.31
28	2	5.05	6.36	6.05	4.42	6.91	8.95	14.06	ns	34.80	28.46	36.99
29	2	63.28	61.99	53.78	51.01	44.21	46.16	63.42	66.08	33.80	ns	ns
30	2	32.81	34.22	31.51	29.31	24.44	ns	17.82	ns	ns	ns	ns
31	2	0.10	0.01	0.14	0.71	6.50	17.06	19.70	ns	ns	ns	ns
32	2	8.45	7.34	6.55	4.14	6.39	9.65	19.57	26.58	56.94	ns	ns
	Mean	**17.87**	**17.60**	**16.59**	**15.44**	**15.89**	**16.79**	**24.88**	**35.50**	**28.68**	**24.37**	**27.27**
33	2	20.60	15.65	16.83	7.76	14.11	17.33	18.10	21.88	ns	32.28	32.26
34	2	ns	ns	ns		ns	ns	ns	ns	ns	ns	ns
35	2	8.38	8.67	7.91	5.68	8.13	8.77	11.83	15.49	31.64	22.38	24.14
36	2	1.87	2.66	1.86	1.60	1.78	2.97	4.82	5.38	9.05	7.67	8.45
37	2	14.18	4.49	21.29	25.01	29.52	23.60	21.93	9.89	37.42	17.69	18.67
38	2	1.41	1.93	3.32	2.56	4.89	4.82	3.01	2.93	3.14	1.68	6.05
39	2	2.02	2.19	1.85	1.88	1.65	1.75	2.15	1.87	4.53	3.50	3.50
40	2	6.35	6.39	6.05	5.35	5.12	5.60	ns	ns	ns	ns	ns
	Mean	**7.83**	**6.00**	**8.44**	**7.12**	**9.31**	**9.26**	**10.31**	**9.57**	**17.16**	**14.20**	**15.51**
41	2	0.01	0.01	0.01	0.75	ns	ns	0.01	0.00	1.28	ns	ns
42	2	49.12	48.28	ns	ns	ns	ns	ns	ns	ns	ns	ns
43	2	9.29	5.75	9.47	21.06	9.03	9.37	8.88	5.85	8.46	ns	ns
44	2	1.73	1.64	1.74	2.78	6.28	7.15	8.38	ns	ns	ns	ns
45	2	4.66	4.78	4.20	5.04	5.53	6.20	8.96	9.20	14.27	7.28	6.90
46	2	6.64	6.38	6.96	5.43	7.32	19.58	32.69	31.79	48.08	ns	ns
47	2	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
48	2	2.92	3.50	6.86	6.91	6.35	5.78	6.73	ns	28.67	24.48	16.03
	Mean	**10.62**	**10.05**	**4.87**	**7.00**	**6.90**	**9.62**	**10.94**	**11.71**	**20.15**	**15.88**	**11.47**
	Overall mean	**12.11**	**11.22**	**9.97**	**9.85**	**10.70**	**11.89**	**15.37**	**18.93**	**22.00**	**18.15**	**18.08**
Effective Rainfall (mm/wk)		35.62	10.40	44.22	35.88	63.88	14.39	0.51	22.86	7.99	13.65	5.74

Appendix 7…continued: Effect of treatment (Dirty water = 1; 2-Cut = 2; Grazed = 3; 1-Cut = 4) on NO_3-N concentrations (mg/l) for each cup and all treatments in in the drainage year October 2001 to June 2002; Effective rainfall (mm/week) (Concentrations in red > MAC; ns = no sample).

Cup	Treatment	27/03/02	03/04/02	10/04/02	16/04/02	23/04/02	01/05/02	09/05/02	14/05/02	22/05/02	29/05/02	05/06/02
25	2	ns	ns	ns	ns	0.00	ns	ns	ns	15.98	0.00	3.96
26	2	46.55	33.78	ns	ns	ns	19.15	7.06	ns	ns	0.00	6.03
27	2	7.44	5.62	6.38	6.92	7.37	5.38	4.79	4.91	6.29	ns	2.47
28	2	35.48	36.62	35.37	35.01	30.07	34.91	ns	29.77	29.41	0.00	18.84
29	2	99.69	79.07	ns	ns	35.10	ns	ns	ns	40.89	0.00	25.13
30	2	24.20	ns	ns	ns	0.00	ns	ns	ns	29.99	0.00	24.43
31	2	ns	ns	ns	ns	ns	ns	ns	ns	0.97	0.00	1.36
32	2	35.64	29.60	ns	ns	29.77	25.81	ns	ns	ns	1.94	14.11
	Mean	**41.50**	**36.94**	**20.88**	**20.97**	**17.05**	**21.31**	**5.93**	**17.34**	**20.59**	**0.28**	**12.04**
33	2	29.20	26.49	25.00	26.10	25.67	23.42	20.25	9.86	ns	0.00	5.52
34	2	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
35	2	21.74	17.75	9.48	8.13	16.15	8.94	1.29	4.19	2.77	0.00	0.53
36	2	7.84	4.22	3.40	3.06	3.04	3.30	ns	1.96	1.00	ns	0.76
37	2	12.78	9.55	15.23	15.83	18.80	12.90	3.56	4.79	6.17	0.81	2.29
38	2	3.74	1.64	0.51	1.12	0.76	0.79	0.34	0.40	0.00	0.00	0.22
39	2	3.51	2.52	1.61	1.99	1.76	1.89	0.58	0.61	0.09	0.00	0.23
40	2	ns	ns	ns	ns	ns	ns	ns	ns	ns	3.42	0.23
	Mean	**13.14**	**10.36**	**9.21**	**9.37**	**11.03**	**8.54**	**5.20**	**3.64**	**2.01**	**0.71**	**1.40**
41	2	0.00	0.00	0.00	0.00	0.00	0.00	ns	ns	ns	0.34	0.05
42	2	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
43	2	0.10	0.83	0.63	1.28	1.01	1.37	ns	ns	ns	ns	0.27
44	2	2.10	2.37	ns	ns	29.41	4.63	2.65	ns	ns	0.00	0.54
45	2	5.07	9.91	8.48	7.78	8.40	8.03	6.81	5.55	4.55	0.00	0.99
46	2	35.35	20.20	19.71	19.05	17.33	0.00	8.65	ns	1.43	ns	10.02
47	2	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
48	2	18.22	17.06	ns	ns	ns	ns	ns	ns	ns	0.00	0.98
	Mean	**10.14**	**8.40**	**7.21**	**7.03**	**11.23**	**2.81**	**6.04**	**5.55**	**2.99**	**0.09**	**2.14**
	Overall mean	**21.59**	**18.56**	**12.43**	**12.45**	**13.10**	**10.89**	**5.72**	**8.84**	**8.53**	**0.36**	**5.19**
Effective Rainfall (mm/wk)		6.81	0.00	0.00	0.00	0.00	16.54	0.00	0.00	23.77	27.14	3.57

Appendix 7…continued: Effect of treatment (Dirty water = 1; 2-Cut = 2; Grazed = 3; 1-Cut = 4) on NO_3-N concentrations (mg/l) for each cup and all treatments in the drainage year October 2001 to June 2002; Effective rainfall (mm/week) (Concentrations in red > MAC; ns = no sample).

Cup	Treatment	24/10/01	31/10/01	07/11/01	14/11/01	21/11/01	28/11/01	05/12/01	12/12/01	19/12/01	26/12/01	02/01/02
49	3	0.40	1.19	ns	0.86	1.84	2.28	3.33	ns	15.21	ns	ns
50	3	9.15	7.94	7.61	8.99	7.99	7.77	7.97	8.60	7.41	7.29	7.68
51	3	0.99	0.16	0.37	0.56	0.82	1.09	1.50	4.01	3.02	2.75	2.53
52	3	ns	6.88	8.63	13.35	14.01	18.65	16.03	25.40	35.82	36.81	37.33
53	3	ns	ns	ns	ns	ns	ns	1.16	ns	ns	ns	ns
54	3	7.19	5.29	3.93	5.71	5.75	6.07	7.35	6.48	5.19	ns	ns
55	3	1.62	0.38	0.18	0.01	0.01	0.01	0.01	0.06	0.55	ns	ns
56	3	7.72	4.29	3.69	3.87	4.45	5.07	6.72	7.76	7.53	8.36	8.56
	Mean	**4.51**	**3.73**	**4.07**	**4.76**	**4.98**	**5.85**	**5.51**	**8.72**	**10.68**	**13.80**	**14.03**
57	3	ns	0.49	ns	0.58	4.02	ns	5.86	ns	ns	ns	ns
58	3	8.31	ns	0.56	4.13	0.39	ns	1.75	1.28	1.13	ns	ns
59	3	2.99	ns	ns	2.35	0.11	ns	0.01	0.08	0.18	ns	ns
60	3	0.93	0.31	0.07	0.14	0.01	0.01	0.01	0.01	ns	ns	ns
61	3	4.60	1.68	1.63	0.45	0.25	0.68	0.65	0.86	1.09	1.46	1.56
62	3	0.59	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.27
63	3	ns	ns	ns	5.98	5.87	7.11	8.24	5.87	ns	ns	ns
64	3	7.83	ns	1.74	1.82	1.95	2.85	4.78	2.82	2.17	ns	ns
	Mean	**4.21**	**0.62**	**0.80**	**1.93**	**1.58**	**2.13**	**2.66**	**1.56**	**0.92**	**0.74**	**0.92**
65	3	16.77	4.23	2.66	ns	1.63	1.76	2.03	1.26	ns	ns	ns
66	3	3.99	5.22	0.22	0.22	0.08	0.92	1.03	2.53	2.83	3.70	4.05
67	3	ns	ns	1.24	ns	ns	1.73	2.33	3.26	4.66	6.91	7.93
68	3	7.30	1.40	0.62	0.54	0.30	0.47	0.45	0.57	1.34	0.62	0.59
69	3	9.45	8.39	9.63	9.44	10.93	13.51	15.60	12.40	15.22	16.05	17.76
70	3	5.38	3.18	1.97	1.98	1.53	1.83	1.73	1.17	1.47	1.56	ns
71	3	29.20	6.03	1.78	0.67	0.36	0.51	0.61	0.67	ns	ns	ns
72	3	ns	13.11	4.98	5.22	5.14	4.82	5.05	4.36	3.34	3.30	3.67
	Mean	**12.02**	**5.94**	**2.89**	**3.01**	**2.85**	**3.19**	**3.60**	**3.28**	**4.81**	**5.36**	**6.80**
	Overall mean	**6.91**	**3.43**	**2.59**	**3.24**	**3.14**	**3.72**	**3.93**	**4.52**	**5.47**	**6.63**	**7.25**
Effective Rainfall (mm/wk)		40.50	2.24	0.34	5.66	0.00	0.00	51.14	4.04	0.00	0.00	3.23

Appendix 7…continued: Effect of treatment (Dirty water = 1; 2-Cut = 2; Grazed = 3; 1-Cut = 4) on NO_3-N concentrations (mg/l) for each cup and all treatments in in the drainage year October 2001 to June 2002; Effective rainfall (mm/week) (Concentrations in red > MAC; ns = no sample).

Cup	Treatment	09/01/02	16/01/02	23/01/02	01/30/02	06/02/02	13/02/02	20/02/02	27/02/02	05/03/02	12/03/02	20/03/02
49	3	5.06	6.12	8.19	6.39	6.70	6.45	5.58	4.15	7.77	ns	ns
50	3	7.09	7.41	5.62	7.05	8.16	8.57	6.51	7.32	15.79	5.50	9.68
51	3	3.21	3.04	3.22	3.24	2.97	2.65	2.61	2.62	5.25	ns	ns
52	3	46.98	32.65	43.15	38.59	9.74	16.25	7.99	8.35	15.83	ns	ns
53	3	1.77	2.33	1.88	1.68	0.91	0.93	0.29	ns	ns	ns	ns
54	3	6.69	5.74	6.94	6.45	7.05	6.20	4.63	6.63	9.89	ns	ns
55	3	1.70	4.42	5.37	6.34	4.58	0.72	ns	0.67	2.07	ns	0.16
56	3	5.69	5.31	2.05	0.00	0.00	0.00	ns	3.45	3.74	2.12	0.00
	Mean	**9.77**	**8.38**	**9.55**	**8.72**	**5.01**	**5.22**	**4.60**	**4.74**	**8.62**	**3.81**	**3.28**
57	3	8.03	7.02	ns	5.42	6.39	ns	ns	ns	ns	ns	ns
58	3	1.34	0.95	0.69	0.34	0.10	ns	ns	0.00	0.00	ns	ns
59	3	0.18	0.01	0.01	0.00	0.00	ns	ns	0.00	0.00	ns	ns
60	3	0.12	0.01	0.01	0.00	0.00	ns	ns	0.00	0.00	0.00	0.00
61	3	1.33	1.59	1.38	3.94	1.79	2.80	2.11	0.76	0.43	0.00	0.00
62	3	0.23	0.13	0.01	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00
63	3	5.20	4.26	4.09	3.35	3.33	3.17	ns	ns	9.14	8.23	9.52
64	3	3.59	2.90	2.85	1.76	1.05	ns	ns	1.72	2.47	1.35	ns
	Mean	**2.50**	**2.11**	**1.29**	**1.86**	**1.58**	**1.99**	**1.06**	**0.41**	**1.72**	**1.92**	**2.38**
65	3	2.06	1.77	3.38	4.69	5.82	ns	ns	4.06	7.30	ns	5.25
66	3	4.84	4.77	7.34	22.28	33.92	40.34	39.83	31.34	53.00	ns	ns
67	3	9.78	9.93	24.77	ns	ns	82.92	87.72	65.83	92.99	67.89	59.20
68	3	0.79	0.55	0.43	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00
69	3	26.67	6.51	21.07	17.43	12.15	8.61	7.88	9.31	19.58	10.92	8.58
70	3	2.45	2.17	2.18	1.78	ns	ns	ns	1.85	4.40	2.94	2.95
71	3	1.38	1.19	1.23	0.79	0.00	0.00	0.00	0.00	0.00	ns	ns
72	3	4.92	3.48	4.48	3.78	2.69	4.15	5.43	5.43	5.75	6.34	5.30
	Mean	**6.61**	**3.80**	**8.11**	**7.30**	**9.10**	**22.67**	**23.48**	**14.73**	**22.88**	**17.62**	**13.55**
	Overall mean	**6.30**	**4.76**	**6.32**	**5.96**	**5.23**	**9.96**	**9.71**	**6.63**	**11.07**	**7.78**	**6.40**
Effective Rainfall (mm/wk)		35.62	10.40	44.22	35.88	63.88	14.39	0.51	22.86	7.99	13.65	5.74

Appendix 7…continued: Effect of treatment (Dirty water = 1; 2-Cut = 2; Grazed = 3; 1-Cut = 4) on NO_3-N concentrations (mg/l) for each cup and all treatments in the drainage year October 2001 to June 2002; Effective rainfall (mm/week) (Concentrations in red > MAC; ns = no sample).

Cup	Treatment	27/03/02	03/04/02	10/04/02	16/04/02	23/04/02	01/05/02	09/05/02	14/05/02	22/05/02	29/05/02	05/06/02
49	3	ns	ns	ns	ns	ns	ns	ns	ns	4.48	2.74	1.37
50	3	5.42	14.31	9.22	8.45	7.39	5.78	5.91	6.76	5.38	2.80	1.20
51	3	4.88	3.92	3.81	3.88	4.36	4.57	ns	ns	3.12	1.80	1.26
52	3	ns	ns	ns	ns	ns	ns	ns	ns	9.39	10.48	8.33
53	3	ns	ns	ns	ns	ns	ns	ns	ns	ns	2.64	5.97
54	3	9.26	7.61	8.16	7.95	9.62	8.71	ns	ns	ns	11.15	ns
55	3	0.00	0.11	ns	ns	0.00	0.00	0.00	ns	ns	0.00	0.00
56	3	0.00	0.00	0.62	2.10	3.45	0.22	4.07	0.00	9.56	0.57	0.00
	Mean	**3.91**	**5.19**	**5.45**	**5.60**	**4.96**	**3.86**	**3.33**	**3.38**	**6.39**	**4.02**	**2.59**
57	3	7.25	ns	ns	ns	ns	ns	ns	ns	1.93	0.00	ns
58	3	0.00	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
59	3	0.00	ns	ns	ns	ns	ns	0.00	0.00	ns	ns	0.00
60	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
61	3	0.00	0.00	0.00	0.00	0.00	0.00	0.3	0.37	0.00	0.00	0.20
62	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	ns	ns
63	3	9.12	6.89	0.00	5.64	5.18	4.36	ns	ns	ns	1.53	0.85
64	3	0.04	ns	ns	ns	ns	ns	0.32	ns	ns	0.08	0.33
	Mean	**2.05**	**1.72**	**0.00**	**1.41**	**1.30**	**1.09**	**0.12**	**0.09**	**0.48**	**0.32**	**0.28**
65	3	3.51	3.11	ns	ns	2.17	ns	1.11	ns	1.43	0.85	0.57
66	3	ns	ns	ns	ns	ns	ns	ns	ns	ns	0.00	0.02
67	3	38.31	23.02	0.00	9.55	8.04	6.77	3.17	ns	ns	0.41	0.94
68	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.00	ns	0.04
69	3	7.49	ns	ns	ns	8.61	6.17	ns	ns	ns	ns	ns
70	3	2.04	1.75	0.00	2.57	ns	ns	ns	2.56	1.53	0.82	0.42
71	3	0.00	0.00	ns	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00
72	3	6.29	6.68	0.00	7.18	7.48	7.37	ns	ns	ns	ns	5.46
	Mean	**8.23**	**5.76**	**0.00**	**3.86**	**4.38**	**4.06**	**1.07**	**0.88**	**0.74**	**0.42**	**1.06**
	Overall mean	**4.73**	**4.22**	**1.82**	**3.62**	**3.55**	**3.00**	**1.51**	**1.45**	**2.54**	**1.59**	**1.31**
Effective Rainfall (mm/wk)		6.81	0.00	0.00	0.00	0.00	16.54	0.00	0.00	23.77	27.14	3.57

Appendix 7…continued: Effect of treatment (Dirty water = 1; 2-Cut = 2; Grazed = 3; 1-Cut = 4) on NO_3-N concentrations (mg/l) for each cup and all treatments in the drainage year October 2001 to June 2002; Effective rainfall (mm/week) (Concentrations in red > MAC; ns = no sample).

Cup	Treatment	24/10/01	31/10/01	07/11/01	14/11/01	21/11/01	28/11/01	05/12/01	12/12/01	19/12/01	26/12/01	02/01/02
73	4	1.71	1.21	2.14	0.61	0.13	0.01	0.01	0.01	0.01	0.01	0.72
74	4	24.16	8.18	3.85	2.62	1.31	1.00	0.58	0.02	0.29	0.39	0.48
75	4	1.48	4.57	1.51	2.47	2.59	2.95	3.66	1.54	1.82	2.41	3.18
76	4	ns	1.54	1.09	1.48	1.11	1.16	1.25	0.72	0.49	0.39	0.50
77	4	13.84	29.82	22.91	20.75	19.01	16.40	14.87	6.23	8.09	8.19	8.29
78	4	0.39	2.26	0.51	0.20	0.01	0.01	0.01	0.01	ns	0.01	0.01
79	4	ns	0.50	0.44	0.52	0.22	0.35	0.04	0.01	0.01	0.01	0.01
80	4	0.65	0.22	0.30	0.45	0.19	0.24	0.02	0.01	0.01	0.01	1.57
	Mean	**7.04**	**6.04**	**4.09**	**3.64**	**3.07**	**2.77**	**2.56**	**1.07**	**1.53**	**1.43**	**1.85**
81	4	4.07	2.19	1.64	1.54	0.93	0.74	5.49	0.80	ns	ns	ns
82	**4**	0.25	1.33	0.01	0.05	0.01	0.01	0.01	0.01	0.01	0.01	0.01
83	4	0.95	0.38	1.34	0.75	0.24	0.09	0.01	0.01	0.01	ns	ns
84	4	0.74	0.33	0.58	1.66	0.57	0.66	0.51	0.01	0.10	0.21	0.60
85	4	6.52	7.10	5.20	7.67	7.85	7.95	7.15	2.82	3.66	4.21	5.17
86	4	8.95	4.30	5.31	5.74	5.46	4.51	3.03	0.17	0.36	0.01	0.01
87	4	2.26	9.05	7.56	8.58	7.71	7.29	7.21	3.77	4.14	4.27	4.08
88	4	ns	1.26	0.92	1.19	0.82	0.91	0.93	0.20	0.24	0.40	0.64
	Mean	**3.39**	**3.24**	**2.82**	**3.40**	**2.95**	**2.77**	**3.04**	**0.97**	**1.22**	**1.52**	**1.75**
89	4	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
90	4	ns	1.24	1.55	1.23	0.73	0.60	0.25	0.01	0.12	0.01	0.01
91	4	0.29	3.18	0.07	0.22	0.08	0.49	0.01	0.01	0.01	0.01	0.01
92	4	0.47	0.47	ns	0.34	0.29	0.18	0.01	0.01	0.01	ns	ns
93	4	1.66	2.60	2.61	2.80	2.51	2.54	2.37	0.50	ns	1.21	1.23
94	4	1.86	1.22	0.65	0.64	0.37	ns	0.64	0.30	0.01	0.01	0.01
95	4	0.82	1.52	0.74	0.37	0.37	0.33	0.52	0.97	9.13	15.35	13.11
96	4	ns	ns	1.37	0.26	0.43	0.01	0.01	0.01	0.01	0.01	0.01
	Mean	**1.02**	**1.71**	**1.17**	**0.84**	**0.68**	**0.69**	**0.54**	**0.26**	**1.55**	**2.77**	**2.40**
	Overall mean	**3.82**	**3.66**	**2.69**	**2.62**	**2.23**	**2.08**	**2.05**	**0.77**	**1.43**	**1.90**	**2.00**
Effective Rainfall (mm/wk)		40.50	2.24	0.34	5.66	0.00	0.00	51.14	4.04	0.00	0.00	3.23

Appendix 7…continued: Effect of treatment (Dirty water = 1; 2-Cut = 2; Grazed = 3; 1-Cut = 4) on NO_3-N concentrations (mg/l) for each cup and all treatments in the drainage year October 2001 to June 2002; Effective rainfall (mm/week) (Concentrations in red > MAC; ns = no sample).

Cup	Treatment	09/01/02	16/01/02	23/01/02	01/30/02	06/02/02	13/02/02	20/02/02	27/02/02	05/03/02	12/03/02	20/03/02
73	4	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.63	0.00
74	4	0.63	0.72	0.37	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00
75	4	2.97	1.78	2.15	2.17	1.84	1.12	1.75	2.83	3.04	2.44	2.95
76	4	0.68	0.54	0.32	0.35	0.07	0.47	0.17	0.00	0.30	ns	ns
77	4	4.87	2.54	3.15	4.12	2.95	2.27	1.35	1.00	0.33	0.00	0.00
78	4	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	ns	ns
79	4	1.40	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	ns	0.00
80	4	0.19	0.01	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00
	Mean	**1.35**	**0.70**	**0.75**	**0.86**	**0.61**	**0.48**	**0.41**	**0.48**	**0.46**	**0.61**	**0.49**
81	4	0.67	0.34	0.01	0.00	0.00	0.56	1.25	2.05	3.39	3.10	ns
82	**4**	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
83	4	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
84	4	0.64	0.22	0.01	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00
85	4	4.77	3.08	2.84	5.87	9.86	15.48	14.19	11.98	25.17	ns	3.22
86	4	0.16	0.01	0.01	4.73	3.55	6.12	5.48	4.03	1.20	ns	ns
87	4	3.09	2.84	2.97	6.75	5.96	2.68	3.27	3.28	4.74	2.90	0.85
88	4	0.96	0.47	0.48	4.67	6.61	4.59	ns	3.87	4.42	1.71	0.59
	Mean	**1.29**	**0.87**	**0.79**	**2.76**	**3.25**	**3.68**	**3.46**	**3.15**	**4.87**	**1.29**	**0.78**
89	4	1.45	ns	ns	0.37	0.17	ns	ns	ns	0.15	ns	ns
90	4	0.01	0.01	0.01	0.00	0.00	ns	ns	ns	0.00	0.00	0.00
91	4	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
92	4	0.01	0.01	0.01	0.00	0.00	0.14	ns	ns	1.81	ns	ns
93	4	0.95	0.91	0.01	35.58	34.44	26.13	ns	19.54	16.82	9.85	6.47
94	4	0.24	0.01	0.01	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00
95	4	28.41	31.84	0.01	51.16	ns	ns	ns	ns	ns	ns	17.99
96	4	0.01	0.01	0.01	0.00	0.25	ns	ns	6.06	9.61	5.91	0.55
	Mean	**3.89**	**4.69**	**0.01**	**10.90**	**4.98**	**6.57**	**0.00**	**6.40**	**4.06**	**3.15**	**4.17**
	Overall mean	**2.17**	**2.09**	**0.52**	**4.84**	**2.95**	**3.58**	**1.29**	**3.34**	**3.13**	**1.68**	**1.81**
Effective Rainfall (mm/wk)		35.62	10.40	44.22	35.88	63.88	14.39	0.51	22.86	7.99	13.65	5.74

Appendix 7…continued: Effect of treatment (Dirty water = 1; 2-Cut = 2; Grazed = 3; 1-Cut = 4) on NO_3-N concentrations (mg/l) for each cup and all treatments in the drainage year October 2001 to June 2002; Effective rainfall (mm/week) (Concentrations in red > MAC; ns = no sample).

Cup	Treatment	27/03/02	03/04/02	10/04/02	16/04/02	23/04/02	01/05/02	09/05/02	14/05/02	22/05/02	29/05/02	05/06/02
73	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	ns	0.00	0.00
74	4	0.00	ns	ns	0.72	0.60	0.27	0.57	0.54	0.22	0.15	0.47
75	4	2.73	2.71	ns	3.99	4.40	3.89	3.59	3.83	3.9	ns	3.84
76	4	0.00	0.00	ns	0.07	ns	ns	0.00	0.00	ns	0.00	0.08
77	4	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00
78	4	0.00	ns	ns	ns	0.00	0.00	ns	0.00	0.00	0.00	0.00
79	4	0.00	0.00	ns	ns	ns	0.00	0.00	ns	ns	0.00	ns
80	4	0.00	0.00	0.00	0.00	0.00	0.00	ns	0.00	0.00	0.00	0.00
	Mean	**0.34**	**0.45**	**0.00**	**0.81**	**0.83**	**0.59**	**0.69**	**0.62**	**0.82**	**0.02**	**0.63**
81	4	ns	0.05	0.00	0.00	0.00	0.00	0.00	ns	ns	0.00	0.00
82	**4**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	ns	ns	0.00	0.00
83	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
84	4	0.00	0.00	0.00	0.27	0.00	0.00	ns	ns	ns	ns	0.07
85	4	7.09	ns	ns	2.65	ns	8.87	8.71	9.09	ns	7.37	4.88
86	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	ns	ns	0.00	0.00
87	4	1.18	ns	ns	0.00	ns	ns	1.97	2.43	2.53	ns	ns
88	4	0.00	0.53	0.47	0.00	1.10	0.61	0.59	0.32	ns	ns	ns
	Mean	**1.18**	**0.10**	**0.08**	**0.37**	**0.18**	**1.35**	**1.61**	**2.96**	**1.27**	**1.47**	**0.83**
89	4	ns	0.70	ns	ns	1.97	ns	ns	ns	ns	0.00	0.04
90	4	0.00	0.00	0.00	0.00	ns	0.00	0.02	0.00	ns	ns	ns
91	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
92	4	0.00	ns	ns	ns	0.00	ns	0.00	ns	ns	0.00	ns
93	4	2.18	1.33	ns	1.72	1.49	1.24	0.53	0.07	0.00	0.00	ns
94	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.5	0.07
95	4	5.26	8.84	15.94	2.37	8.06	6.04	0.01	ns	ns	1.36	1.73
96	4	0.00	0.00	0.00	0.00	0.00	0.00	2.49	ns	0.00	0.00	ns
	Mean	**1.06**	**1.55**	**3.19**	**0.68**	**1.65**	**1.21**	**0.44**	**0.02**	**0.00**	**0.69**	**0.46**
	Overall mean	**0.86**	**0.70**	**1.09**	**0.62**	**0.89**	**1.05**	**0.91**	**1.20**	**0.70**	**0.73**	**0.64**
Effective Rainfall (mm/wk)		6.81	0.00	0.00	0.00	0.00	16.54	0.00	0.00	23.77	27.14	3.57

Appendix 8: Effect of treatment (Dirty water = 1; 2-Cut = 2; Grazed = 3; 1-Cut = 4) on NH_4-N concentrations (mg/l) for each cup and all treatments in the drainage year October 2001 to June 2002; Effective rainfall (mm/week) (Concentrations in red > MAC; ns = no sample).

Cup	Treatment	24/10/01	31/10/01	07/11/01	14/11/01	21/11/01	28/11/01	05/12/01	12/12/01	19/12/01	26/12/01	02/01/02
1	1	ns	ns	0.13	0.02	0.05	ns	0.75	ns	ns	ns	ns
2	1	0.14	0.64	0.96	1.42	ns	ns	0.63	0.25	0.31	0.50	0.37
3	1	0.32	0.40	ns	2.05	0.89	1.03	0.78	0.79	0.76	0.55	0.53
4	1	0.05	0.03	0.19	0.06	0.12	0.20	0.85	1.38	0.77	0.84	0.95
5	1	ns	0.30	ns	0.94	0.93	0.94	0.71	0.58	0.40	0.36	0.26
6	1	ns	0.40	0.22	0.79	0.47	ns	2.26	ns	0.14	ns	ns
7	1	0.22	0.61	0.70	0.65	0.46	0.74	0.64	0.42	0.30	0.29	0.22
8	1	3.61	0.29	0.83	2.10	0.62	1.14	0.95	0.48	0.44	0.60	0.56
	Mean	**0.87**	**0.38**	**0.51**	**1.00**	**0.51**	**0.81**	**0.95**	**0.65**	**0.45**	**0.52**	**0.48**
9	1	0.15	2.37	ns	2.70	0.91	0.93	0.36	0.45	0.52	0.55	0.55
10	1	0.02	0.12	0.39	0.27	0.33	0.28	0.14	0.10	0.01	0.12	0.01
11	1	1.20	1.73	1.32	1.47	1.11	1.23	0.72	0.52	0.33	0.18	0.01
12	1	ns	ns	ns	0.09	0.07	0.06	0.09	0.20	0.11	0.01	0.01
13	1	ns	0.01	0.14	0.19	0.29	0.46	0.40	0.37	0.34	0.31	0.28
14	1	ns	ns	ns	0.14	0.04	0.73	0.49	ns	ns	ns	ns
15	1	0.06	0.19	0.92	0.49	0.56	0.78	0.38	0.43	0.50	0.48	0.39
16	1	0.02	0.01	0.11	0.07	0.18	0.11	0.09	0.09	0.01	0.01	0.01
	Mean	**0.29**	**0.74**	**0.58**	**0.68**	**0.44**	**0.57**	**0.33**	**0.31**	**0.26**	**0.24**	**0.18**
17	1	0.04	0.01	0.12	0.13	0.08	0.31	0.14	0.09	0.18	0.20	0.19
18	1	0.08	0.78	ns	0.88	0.26	0.15	0.42	0.11	0.13	0.11	0.12
19	1	0.04	0.19	0.33	0.57	0.38	0.40	0.13	0.13	0.16	0.22	0.17
20	1	0.27	ns	0.19	0.17	0.08	0.17	0.14	0.13	ns	0.21	0.18
21	1	0.01	0.19	0.35	0.40	0.34	0.47	0.14	0.10	0.11	0.10	0.01
22	1	0.01	0.07	0.10	0.21	0.23	0.13	0.09	0.08	0.01	0.01	0.01
23	1	ns	ns	ns	ns	ns	ns	0.53	0.15	0.32	0.40	0.44
24	1	0.06	0.11	0.10	0.01	0.08	0.23	0.16	0.15	0.14	0.19	0.01
	Mean	**0.07**	**0.23**	**0.20**	**0.34**	**0.21**	**0.27**	**0.22**	**0.12**	**0.15**	**0.18**	**0.14**
	Overall mean	**0.41**	**0.45**	**0.43**	**0.67**	**0.38**	**0.55**	**0.50**	**0.36**	**0.29**	**0.31**	**0.27**
Effective Rainfall (mm/wk)		40.50	2.24	0.34	5.66	0.00	0.00	51.14	4.04	0.00	0.00	3.23

Appendix 8…continued: Effect of treatment (Dirty water = 1; 2-Cut = 2; Grazed = 3; 1-Cut = 4) on NH_4-N concentrations (mg/l) for each cup and all treatments in the drainage year October 2001 to June 2002; Effective rainfall (mm/week) (Concentrations in red > MAC; ns = no sample).

Cup	Treatment	09/01/02	16/01/02	23/01/02	01/30/02	06/02/02	13/02/02	20/02/02	27/02/02	05/03/02	12/03/02	20/03/02
1	1	0.26	0.23	ns	ns	0.08	ns	ns	ns	ns	ns	ns
2	1	0.18	0.25	0.16	0.07	0.14	0.12	0.15	0.16	0.15	0.25	0.22
3	1	0.45	0.46	0.31	0.18	0.20	0.13	ns	ns	ns	ns	ns
4	1	1.17	1.23	1.03	0.73	0.41	0.35	0.60	0.58	0.40	0.86	0.70
5	1	0.26	0.43	0.26	0.20	0.17	0.57	0.57	0.31	0.15	0.21	0.18
6	1	2.22	0.53	ns	0.78	0.55	ns	ns	ns	1.27	ns	ns
7	1	0.22	0.36	ns	0.16	0.02	0.01	0.02	0.01	0.10	0.19	0.13
8	1	0.49	0.45	0.19	0.02	0.01	0.04	0.46	ns	0.10	ns	ns
	Mean	**0.66**	**0.49**	**0.39**	**0.31**	**0.20**	**0.20**	**0.36**	**0.27**	**0.36**	**0.38**	**0.31**
9	1	0.61	0.49	0.26	0.04	0.11	0.20	0.40	0.17	ns	ns	ns
10	1	0.10	0.11	0.01	0.01	0.01	ns	ns	ns	ns	ns	ns
11	1	0.10	0.27	0.01	0.01	0.01	0.01	ns	ns	0.07	0.05	ns
12	1	0.01	0.11	0.10	0.04	0.01	ns	ns	ns	ns	ns	ns
13	1	0.34	0.31	0.26	0.73	0.08	0.06	0.01	0.01	0.09	0.15	0.16
14	1	0.26	0.41	0.38	0.16	0.21	ns	ns	ns	ns	ns	0.38
15	1	0.55	0.79	0.43	0.22	0.27	0.30	0.40	0.30	0.23	0.64	0.66
16	1	0.11	0.18	0.01	0.02	0.01	0.01	0.01	0.01	0.14	0.17	0.12
	Mean	**0.26**	**0.33**	**0.18**	**0.15**	**0.09**	**0.12**	**0.21**	**0.12**	**0.13**	**0.25**	**0.33**
17	1	0.18	0.18	0.13	0.01	0.01	ns	ns	ns	0.14	0.07	0.07
18	1	0.15	0.22	0.13	0.01	0.01	0.01	0.01	ns	0.14	0.18	0.11
19	1	0.22	0.14	0.10	0.03	0.03	0.02	0.01	0.01	0.02	0.11	0.07
20	1	0.14	0.16	0.16	0.18	0.03	0.05	0.18	ns	0.07	ns	ns
21	1	0.10	0.37	0.01	0.01	0.03	0.03	0.37	0.01	0.07	0.14	0.27
22	1	0.10	0.12	0.01	0.01	0.01	0.01	0.01	0.01	0.03	ns	ns
23	1	0.32	0.36	0.20	0.07	ns	ns	ns	ns	ns	ns	ns
24	1	0.19	0.01	0.01	0.01	0.01	0.03	0.70	0.01	0.10	0.13	0.14
	Mean	**0.18**	**0.20**	**0.09**	**0.04**	**0.02**	**0.03**	**0.21**	**0.01**	**0.08**	**0.13**	**0.13**
	Overall mean	**0.36**	**0.34**	**0.22**	**0.17**	**0.10**	**0.11**	**0.26**	**0.13**	**0.19**	**0.25**	**0.26**
Effective Rainfall (mm/wk)		35.62	10.40	44.22	35.88	63.88	14.39	0.51	22.86	7.99	13.65	5.74

Appendix 8…continued: Effect of treatment (Dirty water = 1; 2-Cut = 2; Grazed = 3; 1-Cut = 4) on NH_4-N concentrations (mg/l) for each cup and all treatments in the drainage year October 2001 to June 2002; Effective rainfall (mm/week) (Concentrations in red > MAC; ns = no sample).

Cup	Treatment	27/03/02	03/04/02	10/04/02	16/04/02	23/04/02	01/05/02	09/05/02	14/05/02	22/05/02	29/05/02	05/06/02
1	1	0.05	0.03	ns	ns	ns	ns	ns	ns	ns	ns	ns
2	1	0.24	0.20	0.25	0.21	0.44	0.26	0.13	0.10	0.25	0.11	0.13
3	1	ns	ns	ns	ns	ns	ns	ns	ns	2.49	0.26	0.21
4	1	0.72	0.84	0.67	0.61	1.04	0.60	1.87	0.87	0.12	ns	ns
5	1	0.17	0.11	0.14	0.26	0.27	0.22	0.22	0.21	ns	0.90	0.22
6	1	ns	ns	ns	ns	ns	ns	ns	ns	1.61	0.21	0.08
7	1	0.08	0.06	0.08	ns	0.11	ns	ns	ns	ns	ns	ns
8	1	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
	Mean	**0.25**	**0.25**	**0.29**	**0.36**	**0.47**	**0.36**	**0.74**	**0.39**	**1.12**	**0.37**	**0.16**
9	1	ns	ns	ns	ns	1.79	0.31	ns	ns	ns	ns	ns
10	1	0.07	0.07	0.12	0.16	0.24	0.28	0.23	0.30	0.26	0.13	0.19
11	1	0.05	0.04	0.05	0.05	0.04	0.04	ns	ns	ns	0.36	0.13
12	1	ns	ns	0.09	ns	ns	ns	ns	ns	ns	ns	ns
13	1	0.15	0.14	0.16	0.17	0.13	0.13	0.14	0.16	0.16	0.12	0.11
14	1	0.03	ns	ns	ns	0.00	0.15	ns	ns	ns	ns	0.31
15	1	0.64	0.43	0.46	0.37	ns	ns	0.65	0.50	0.46	0.24	0.17
16	1	0.19	0.18	0.29	0.22	0.27	0.27	0.15	0.38	0.37	0.24	0.11
	Mean	**0.19**	**0.17**	**0.20**	**0.19**	**0.41**	**0.20**	**0.29**	**0.34**	**0.31**	**0.22**	**0.17**
17	1	0.04	0.08	0.07	0.09	0.13	0.07	0.07	0.15	0.13	ns	0.13
18	1	0.09	0.10	ns	ns	ns	ns	0.10	8.58	0.25	0.30	0.17
19	1	0.07	0.06	0.08	0.05	0.10	0.13	0.20	0.17	0.14	0.14	0.06
20	1	0.19	0.12	0.14	0.29	ns	ns	ns	ns	ns	ns	ns
21	1	0.63	ns	ns	ns	ns	ns	ns	0.22	0.12	0.17	0.12
22	1	0.09	ns	ns	ns	ns	ns	ns	ns	ns	ns	0.06
23	1	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
24	1	0.16	0.17	0.13	0.10	0.14	ns	ns	ns	ns	ns	0.61
	Mean	**0.18**	**0.11**	**0.11**	**0.13**	**0.12**	**0.10**	**0.12**	**2.28**	**0.16**	**0.20**	**0.19**
	Overall mean	**0.21**	**0.18**	**0.20**	**0.23**	**0.33**	**0.22**	**0.39**	**1.00**	**0.53**	**0.26**	**0.17**
Effective Rainfall (mm/wk)		6.81	0.00	0.00	0.00	0.00	16.54	0.00	0.00	23.77	27.14	3.57

Appendix 8…continued: Effect of treatment (Dirty water = 1; 2-Cut = 2; Grazed = 3; 1-Cut = 4) on NH_4-N concentrations (mg/l) for each cup and all treatments in the drainage year October 2001 to June 2002; Effective rainfall (mm/week) (Concentrations in red > MAC; ns = no sample).

Cup	Treatment	24/10/01	31/10/01	07/11/01	14/11/01	21/11/01	28/11/01	05/12/01	12/12/01	19/12/01	26/12/01	02/01/02
25	2	2.26	ns	ns	ns	ns	ns	2.35	0.14	0.27	ns	ns
26	2	0.44	0.02	0.38	0.57	0.74	0.43	0.37	0.28	0.21	0.24	0.19
27	2	0.32	0.11	0.25	0.18	0.20	0.17	0.40	0.26	0.20	0.20	0.20
28	2	4.13	0.73	0.14	0.09	0.13	0.36	0.17	0.30	0.31	0.37	0.32
29	2	0.52	0.02	0.07	0.19	0.40	0.70	0.54	0.47	0.44	0.60	0.24
30	2	2.63	2.37	ns	1.23	0.56	0.44	0.32	0.19	0.88	ns	ns
31	2	4.30	0.78	0.16	0.17	0.39	0.50	0.33	0.29	0.23	0.20	0.17
32	2	0.54	0.01	0.16	0.31	0.29	0.41	0.26	0.10	0.01	0.01	0.13
	Mean	**1.89**	**0.58**	**0.19**	**0.39**	**0.39**	**0.43**	**0.59**	**0.25**	**0.32**	**0.27**	**0.21**
33	2	0.34	0.01	0.22	0.18	0.55	1.33	0.37	0.71	0.21	0.14	0.16
34	2	3.65	ns	0.83	ns	ns	ns	ns	ns	ns	ns	**ns**
35	2	ns	1.37	0.21	0.56	0.91	1.79	1.28	1.64	1.17	1.08	0.23
36	2	ns	ns	0.16	0.45	0.30	0.31	0.27	0.34	0.47	0.41	ns
37	2	1.07	0.04	0.15	0.29	0.54	0.45	0.35	0.33	0.18	0.20	0.16
38	2	0.30	0.01	0.14	0.09	0.24	0.34	0.16	0.31	0.13	0.11	0.11
39	2	0.57	0.01	0.10	0.12	0.36	0.66	0.49	0.43	0.21	0.15	0.20
40	2	0.10	0.04	0.07	0.30	0.30	1.06	0.53	0.73	0.69	0.59	0.87
	Mean	**1.01**	**0.25**	**0.24**	**0.28**	**0.46**	**0.85**	**0.49**	**0.64**	**0.44**	**0.38**	**0.29**
41	2	ns	ns	ns	11.28	0.12	0.53	0.15	0.28	0.89	1.47	0.29
42	2	ns	ns	ns	ns	ns	ns	1.56	ns	ns	ns	ns
43	2	ns	ns	ns	ns	2.08	0.17	0.05	0.21	0.15	0.61	0.63
44	2	ns	1.55	0.09	0.14	0.36	0.55	0.30	0.36	0.20	ns	ns
45	2	ns	1.62	0.34	0.83	0.48	0.47	0.27	0.12	0.01	0.01	0.10
46	2	ns	1.84	0.63	0.73	0.93	0.53	0.32	0.29	0.35	0.26	0.29
47	2	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
48	2	ns	0.90	0.07	0.18	0.48	0.55	0.47	0.60	0.64	ns	ns
	Mean	ns	**1.48**	**0.28**	**2.63**	**0.74**	**0.47**	**0.45**	**0.31**	**0.37**	**0.59**	**0.33**
	Overall mean	**1.45**	**0.77**	**0.24**	**1.10**	**0.53**	**0.58**	**0.51**	**0.40**	**0.38**	**0.41**	**0.27**
Effective Rainfall (mm/wk)		40.50	2.24	0.34	5.66	0.00	0.00	51.14	4.04	0.00	0.00	3.23

Appendix 8…continued: Effect of treatment (Dirty water = 1; 2-Cut = 2; Grazed = 3; 1-Cut = 4) on NH_4-N concentrations (mg/l) for each cup and all treatments in the drainage year October 2001 to June 2002; Effective rainfall (mm/week) (Concentrations in red > MAC; ns = no sample).

Cup	Treatment	09/01/02	16/01/02	23/01/02	01/30/02	06/02/02	13/02/02	20/02/02	27/02/02	05/03/02	12/03/02	20/03/02
25	2	0.13	0.16	0.01	0.08	0.06	ns	ns	ns	ns	ns	ns
26	2	0.19	0.11	0.01	0.01	0.01	0.13	ns	ns	0.03	0.05	0.08
27	2	0.51	0.44	0.67	0.31	0.29	0.43	0.87	0.39	0.35	0.56	0.50
28	2	0.45	0.34	0.16	0.01	0.01	0.02	0.01	ns	0.21	0.38	0.25
29	2	0.49	0.37	0.12	0.01	0.01	0.01	0.01	0.01	0.04	ns	ns
30	2	0.56	0.90	0.01	0.02	0.01	ns	0.10	ns	ns	ns	ns
31	2	0.31	0.20	0.15	0.01	0.05	0.10	0.13	ns	ns	ns	ns
32	2	0.22	0.20	0.17	0.06	0.10	0.15	0.49	0.28	0.22	ns	ns
	Mean	**0.36**	**0.34**	**0.16**	**0.06**	**0.07**	**0.14**	**0.27**	**0.23**	**0.17**	**0.33**	**0.28**
33	2	0.33	0.11	0.01	0.01	0.06	0.08	0.29	0.16	ns	0.42	0.30
34	2	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
35	2	3.38	1.39	0.70	0.26	0.16	0.12	0.19	0.17	0.21	0.25	0.12
36	2	0.38	0.27	0.13	0.01	0.01	0.01	0.01	0.01	0.08	0.14	0.17
37	2	0.16	0.01	0.01	0.01	0.01	0.01	0.40	0.01	0.03	0.09	0.06
38	2	0.13	0.01	0.01	0.01	0.01	0.03	0.10	0.01	0.04	0.04	0.05
39	2	0.27	0.13	0.01	0.01	0.07	0.08	0.39	0.11	0.07	0.26	0.16
40	2	2.34	0.78	0.53	0.29	0.31	0.32	ns	ns	ns	ns	ns
	Mean	**1.00**	**0.39**	**0.20**	**0.09**	**0.09**	**0.09**	**0.23**	**0.08**	**0.09**	**0.20**	**0.14**
41	2	0.38	0.26	0.18	0.09	ns	ns	0.39	0.01	0.32	ns	ns
42	2	0.01	0.13	ns	ns	ns	ns	ns	ns	ns	ns	ns
43	2	0.01	0.35	0.26	0.00	0.25	0.02	0.94	0.01	0.04	ns	ns
44	2	0.01	0.28	0.14	0.05	0.01	0.05	0.10	ns	ns	ns	ns
45	2	0.01	0.23	0.15	0.06	0.06	0.11	0.01	0.01	0.06	0.08	0.08
46	2	0.01	0.22	0.26	0.18	0.23	0.17	0.45	0.19	0.15	ns	ns
47	2	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
48	2	0.01	0.87	0.49	0.13	0.15	0.24	0.10	ns	0.46	0.05	0.09
	Mean	**0.06**	**0.33**	**0.25**	**0.09**	**0.14**	**0.12**	**0.33**	**0.06**	**0.21**	**0.07**	**0.09**
	Overall mean	**0.47**	**0.35**	**0.20**	**0.08**	**0.10**	**0.12**	**0.28**	**0.12**	**0.15**	**0.20**	**0.17**
Effective Rainfall (mm/wk)		35.62	10.40	44.22	35.88	63.88	14.39	0.51	22.86	7.99	13.65	5.74

Appendix 8…continued: Effect of treatment (Dirty water = 1; 2-Cut = 2; Grazed = 3; 1-Cut = 4) on NH_4-N concentrations (mg/l) for each cup and all treatments in the drainage year October 2001 to June 2002; Effective rainfall (mm/week) (Concentrations in red > MAC; ns = no sample).

Cup	Treatment	27/03/02	03/04/02	10/04/02	16/04/02	23/04/02	01/05/02	09/05/02	14/05/02	22/05/02	29/05/02	05/06/02
25	2	ns	ns	ns	ns	0.00	ns	ns	ns	0.04	0.09	0.18
26	2	0.03	0.17	ns	ns	ns	1.56	0.42	ns	ns	0.16	0.39
27	2	0.36	0.27	0.27	0.26	0.30	0.38	0.29	0.48	0.65	ns	0.42
28	2	0.33	0.44	0.57	0.44	0.10	0.56	ns	0.66	0.64	0.45	0.42
29	2	0.07	0.05	ns	ns	0.48	ns	ns	ns	0.55	0.09	0.34
30	2	0.12	ns	ns	ns	0.00	ns	ns	ns	0.06	0.00	0.18
31	2	ns	ns	ns	ns	ns	ns	ns	ns	4.67	0.00	0.11
32	2	0.18	0.23	ns	ns	0.22	0.17	ns	ns	ns	0.00	0.09
	Mean	**0.18**	**0.23**	**0.42**	**0.35**	**0.18**	**0.67**	**0.36**	**0.57**	**1.10**	**0.11**	**0.27**
33	2	0.30	0.42	0.32	0.29	0.33	0.34	0.32	0.46	ns	0.00	0.26
34	2	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
35	2	0.58	0.34	0.45	0.46	0.48	2.08	0.34	0.64	0.95	0.00	0.69
36	2	0.19	0.13	0.15	0.20	0.24	0.23	ns	0.35	0.43	ns	0.44
37	2	0.04	0.03	0.03	0.04	0.04	0.08	0.05	0.41	0.25	0.00	0.16
38	2	0.03	0.09	0.04	0.03	0.01	0.01	0.02	0.11	0.20	0.00	0.25
39	2	0.18	0.10	0.12	0.16	0.15	0.17	0.15	0.26	0.34	0.00	0.14
40	2	ns	ns	ns	ns	ns	ns	ns	ns	ns	4.31	0.16
	Mean	**0.22**	**0.19**	**0.19**	**0.20**	**0.21**	**0.49**	**0.18**	**0.37**	**0.43**	**0.72**	**0.30**
41	2	0.05	0.03	0.03	0.03	0.01	0.02	ns	ns	ns	0.09	0.13
42	2	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
43	2	0.04	0.03	0.18	0.26	0.33	0.10	ns	ns	ns	ns	0.02
44	2	0.11	0.03	ns	ns	0.02	0.01	0.08	ns	ns	0.07	0.05
45	2	0.05	0.05	0.03	0.01	0.03	0.01	0.07	0.11	0.16	0.09	0.03
46	2	0.32	0.08	0.19	0.22	0.34	0.29	0.20	ns	0.11	ns	0.33
47	2	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
48	2	0.13	0.13	ns	ns	ns	ns	ns	ns	ns	0.73	0.22
	Mean	**0.12**	**0.06**	**0.11**	**0.13**	**0.15**	**0.09**	**0.12**	**0.11**	**0.14**	**0.25**	**0.13**
	Overall mean	**0.17**	**0.16**	**0.24**	**0.23**	**0.18**	**0.41**	**0.22**	**0.35**	**0.56**	**0.36**	**0.23**
Effective Rainfall (mm/wk)		6.81	0.00	0.00	0.00	0.00	16.54	0.00	0.00	23.77	27.14	3.57

Appendix 8…continued: Effect of treatment (Dirty water = 1; 2-Cut = 2; Grazed = 3; 1-Cut = 4) on NH_4-N concentrations (mg/l) for each cup and all treatments in the drainage year October 2001 to June 2002; Effective rainfall (mm/week) (Concentrations in red > MAC; ns = no sample).

Cup	Treatment	24/10/01	31/10/01	07/11/01	14/11/01	21/11/01	28/11/01	05/12/01	12/12/01	19/12/01	26/12/01	02/01/02
49	3	0.39	0.41	ns	5.35	0.66	0.80	0.42	ns	0.34	ns	ns
50	3	0.11	0.33	0.89	1.42	0.95	0.95	0.67	0.63	0.41	0.54	0.52
51	3	0.03	0.12	0.18	0.05	0.08	0.05	0.05	0.06	0.01	0.01	0.01
52	3	ns	0.26	0.21	0.34	0.53	0.72	0.34	0.30	0.29	0.47	0.44
53	3	ns	ns	ns	ns	ns	ns	1.23	ns	ns	ns	ns
54	3	0.53	0.47	0.49	0.51	0.38	0.34	0.27	0.21	0.62	ns	ns
55	3	0.56	1.74	1.40	3.35	1.81	2.30	1.04	0.88	0.73	ns	ns
56	3	0.12	2.32	0.88	1.50	1.78	1.81	0.90	0.72	0.72	0.41	0.11
	Mean	**0.29**	**0.81**	**0.68**	**1.79**	**0.88**	**1.00**	**0.62**	**0.47**	**0.45**	**0.36**	**0.27**
57	3	ns	0.07	ns	0.91	0.46	ns	1.75	ns	ns	ns	ns
58	3	0.24	ns	1.06	0.14	0.79	ns	0.26	0.21	0.11	ns	ns
59	3	0.61	ns	ns	0.39	0.41	ns	0.40	2.41	1.30	ns	ns
60	3	0.71	0.40	0.57	0.32	0.21	0.26	0.16	0.14	ns	ns	ns
61	3	0.57	0.78	0.71	0.74	0.72	0.76	0.64	0.46	0.47	0.46	0.48
62	3	0.36	0.33	0.37	0.39	0.32	0.31	0.28	0.19	0.19	0.16	0.22
63	3	ns	ns	ns	0.11	0.22	0.43	0.25	0.27	ns	ns	ns
64	3	0.35	ns	0.29	0.39	0.15	0.67	0.31	0.24	0.15	ns	ns
	Mean	**0.47**	**0.40**	**0.60**	**0.42**	**0.41**	**0.49**	**0.51**	**0.56**	**0.44**	**0.31**	**0.35**
65	3	0.04	0.18	0.29	ns	0.28	0.23	0.17	0.15	ns	ns	ns
66	3	0.10	0.10	0.33	0.28	0.16	0.38	0.19	0.16	0.16	0.15	0.17
67	3	ns	ns	0.10	ns	ns	0.08	0.21	0.17	0.22	0.25	0.32
68	3	0.01	0.09	0.22	0.26	0.40	0.41	0.60	0.25	0.21	0.25	0.29
69	3	0.01	0.58	0.78	0.61	0.48	0.73	0.50	0.43	0.37	1.33	0.34
70	3	0.23	0.22	0.37	0.27	0.19	0.16	0.15	0.07	0.14	0.13	ns
71	3	0.04	0.22	0.31	0.32	0.27	0.24	0.18	0.73	ns	ns	ns
72	3	ns	0.01	0.18	0.18	0.19	0.11	0.08	0.05	0.10	0.01	0.12
	Mean	**0.07**	**0.20**	**0.32**	**0.32**	**0.28**	**0.29**	**0.26**	**0.25**	**0.20**	**0.35**	**0.25**
	Overall mean	**0.28**	**0.47**	**0.53**	**0.84**	**0.53**	**0.59**	**0.46**	**0.43**	**0.36**	**0.34**	**0.29**
Effective Rainfall (mm/wk)		40.50	2.24	0.34	5.66	0.00	0.00	51.14	4.04	0.00	0.00	3.23

Appendix 8…continued: Effect of treatment (Dirty water = 1; 2-Cut = 2; Grazed = 3; 1-Cut = 4) on NH_4-N concentrations (mg/l) for each cup and all treatments in the drainage year October 2001 to June 2002; Effective rainfall (mm/week) (Concentrations in red > MAC; ns = no sample).

Cup	Treatment	09/01/02	16/01/02	23/01/02	01/30/02	06/02/02	13/02/02	20/02/02	27/02/02	05/03/02	12/03/02	20/03/02
49	3	0.01	0.46	0.44	0.20	0.10	0.03	0.01	0.01	0.07	ns	ns
50	3	0.01	0.47	0.23	0.06	0.04	0.01	0.01	0.01	0.02	0.07	0.08
51	3	0.01	0.01	0.10	0.01	0.01	0.01	0.01	0.01	0.08	ns	ns
52	3	0.01	0.27	0.22	0.09	0.07	0.11	0.34	0.01	0.09	ns	ns
53	3	0.32	0.16	0.58	0.16	0.10	0.16	1.16	ns	ns	ns	ns
54	3	0.48	0.28	0.14	0.01	0.03	0.07	0.12	0.01	0.06	ns	ns
55	3	1.05	0.35	0.14	0.01	0.01	0.01	ns	0.72	0.08	ns	0.97
56	3	0.23	0.01	0.01	0.01	0.01	0.01	ns	0.01	0.04	0.13	0.08
	Mean	**0.27**	**0.25**	**0.23**	**0.07**	**0.05**	**0.05**	**0.28**	**0.11**	**0.06**	**0.10**	**0.38**
57	3	0.32	0.71	ns	0.65	0.27	ns	ns	ns	ns	ns	ns
58	3	0.17	0.01	0.01	0.01	0.01	ns	ns	0.01	0.05	ns	ns
59	3	0.58	0.20	0.21	0.03	0.05	ns	ns	0.11	0.06	ns	ns
60	3	0.29	0.23	0.12	0.05	0.21	ns	ns	0.01	0.10	0.32	0.26
61	3	0.88	0.51	0.39	0.17	0.29	0.23	0.58	0.21	0.19	0.41	0.40
62	3	0.30	0.23	0.24	0.09	0.14	0.15	1.01	0.28	0.15	0.27	0.24
63	3	0.47	0.36	0.40	0.26	0.56	0.25	ns	ns	0.26	0.22	0.18
64	3	0.37	0.38	0.25	0.15	0.48	ns	ns	0.50	0.11	0.38	ns
	Mean	**0.42**	**0.33**	**0.23**	**0.18**	**0.25**	**0.21**	**0.80**	**0.19**	**0.13**	**0.32**	**0.27**
65	3	0.28	0.16	0.20	0.13	0.19	ns	ns	0.22	0.11	ns	0.42
66	3	0.30	0.21	0.16	0.04	0.06	0.09	0.14	0.01	0.16	ns	ns
67	3	0.31	0.32	0.23	ns	ns	0.14	0.01	0.01	0.05	0.10	0.22
68	3	0.34	0.37	0.25	0.13	0.17	0.15	0.24	0.15	0.14	0.22	0.39
69	3	0.36	0.17	0.22	0.09	0.16	0.11	0.23	0.01	0.11	0.19	0.17
70	3	0.35	0.22	0.35	0.08	ns	ns	ns	0.22	0.15	0.24	0.19
71	3	0.57	0.31	0.25	0.06	0.13	0.15	0.17	0.15	0.13	ns	ns
72	3	0.27	0.10	0.12	0.05	0.12	0.08	0.01	0.01	0.09	0.18	0.18
	Mean	**0.35**	**0.23**	**0.22**	**0.08**	**0.14**	**0.12**	**0.13**	**0.10**	**0.12**	**0.19**	**0.26**
	Overall mean	**0.35**	**0.27**	**0.23**	**0.11**	**0.15**	**0.13**	**0.40**	**0.13**	**0.10**	**0.20**	**0.30**
Effective Rainfall (mm/wk)		35.62	10.40	44.22	35.88	63.88	14.39	0.51	22.86	7.99	13.65	5.74

Appendix 8…continued: Effect of treatment (Dirty water = 1; 2-Cut = 2; Grazed = 3; 1-Cut = 4) on NH_4-N concentrations (mg/l) for each cup and all treatments in the drainage year October 2001 to June 2002; Effective rainfall (mm/week) (Concentrations in red > MAC; ns = no sample).

Cup	Treatment	27/03/02	03/04/02	10/04/02	16/04/02	23/04/02	01/05/02	09/05/02	14/05/02	22/05/02	29/05/02	05/06/02
49	3	ns	ns	ns	ns	ns	ns	ns	ns	0.32	0.08	0.02
50	3	0.08	0.09	0.17	0.11	0.27	0.14	0.15	0.12	0.13	0.14	0.08
51	3	0.12	0.07	0.04	0.05	0.08	0.09	ns	ns	0.28	0.11	0.15
52	3	ns	ns	ns	ns	ns	ns	ns	ns	0.60	0.07	0.05
53	3	ns	ns	ns	ns	ns	ns	ns	ns	ns	0.73	0.11
54	3	0.28	0.21	0.14	0.07	0.11	0.11	ns	ns	ns	0.44	ns
55	3	0.35	1.16	ns	ns	0.04	0.19	0.52	ns	ns	0.08	0.16
56	3	0.07	0.05	0.05	0.12	0.18	0.28	0.37	0.34	0.13	0.11	0.04
	Mean	**0.18**	**0.32**	**0.10**	**0.09**	**0.14**	**0.16**	**0.35**	**0.23**	**0.29**	**0.22**	**0.09**
57	3	0.62	ns	ns	ns	ns	ns	ns	ns	0.38	0.22	ns
58	3	0.11	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
59	3	0.27	ns	ns	ns	ns	ns	0.24	0.13	ns	ns	0.02
60	3	0.27	0.28	0.43	1.28	0.45	0.27	0.16	0.29	0.34	0.54	0.19
61	3	0.16	0.08	0.10	0.13	0.12	0.07	0.15	0.02	0.08	0.03	0.03
62	3	0.27	0.22	0.29	0.28	0.40	0.34	0	0.26	0.30	ns	ns
63	3	0.25	0.31	0.32	0.25	0.30	0.12	ns	ns	ns	1.63	0.04
64	3	0.27	ns	ns	ns	ns	ns	0.09	ns	ns	0.19	0.07
	Mean	**0.28**	**0.22**	**0.29**	**0.49**	**0.32**	**0.20**	**0.13**	**0.18**	**0.28**	**0.52**	**0.07**
65	3	0.23	0.17	ns	ns	0.86	ns	0.32	ns	0.28	0.19	0.14
66	3	ns	ns	ns	ns	ns	ns	ns	ns	ns	0.51	0.14
67	3	0.17	0.18	0.21	0.25	0.36	0.27	0.21	ns	ns	0.27	0.14
68	3	0.22	0.18	0.18	0.17	0.18	0.15	0.12	0.16	0.17	ns	0.11
69	3	0.19	ns	ns	ns	0.31	0.12	ns	ns	ns	ns	ns
70	3	0.24	0.26	0.24	0.29	ns	ns	ns	0.58	0.26	0.15	0.16
71	3	0.51	0.33	ns	0.00	0.66	0.33	0.36	0.30	0.35	0.25	0.28
72	3	0.13	0.17	0.22	0.20	0.19	0.15	ns	ns	ns	ns	0.19
	Mean	**0.24**	**0.22**	**0.21**	**0.18**	**0.43**	**0.20**	**0.25**	**0.35**	**0.27**	**0.27**	**0.17**
	Overall mean	**0.23**	**0.25**	**0.20**	**0.25**	**0.29**	**0.19**	**0.24**	**0.25**	**0.28**	**0.34**	**0.11**
Effective Rainfall (mm/wk)		6.81	0.00	0.00	0.00	0.00	16.54	0.00	0.00	23.77	27.14	3.57

Appendix 8…continued: Effect of treatment (Dirty water = 1; 2-Cut = 2; Grazed = 3; 1-Cut = 4) on NH_4-N concentrations (mg/l) for each cup and all treatments in the drainage year October 2001 to June 2002; Effective rainfall (mm/week) (Concentrations in red > MAC; ns = no sample).

Cup	Treatment	24/10/01	31/10/01	07/11/01	14/11/01	21/11/01	28/11/01	05/12/01	12/12/01	19/12/01	26/12/01	02/01/02
73	4	0.24	0.02	0.14	0.15	0.22	0.29	0.20	0.08	0.16	0.17	0.01
74	4	0.25	0.20	1.21	0.75	1.13	1.76	0.93	1.06	0.75	0.01	0.55
75	4	0.12	0.13	0.13	0.02	0.07	0.12	0.12	0.14	0.16	0.29	0.16
76	4	ns	0.01	0.05	0.24	0.30	0.31	0.39	0.37	0.30	0.26	0.17
77	4	0.18	0.20	0.33	0.34	0.38	0.20	0.10	0.12	0.01	0.01	0.01
78	4	0.25	0.39	0.39	0.40	0.45	0.58	0.38	0.18	ns	0.18	0.17
79	4	ns	0.22	1.14	0.86	1.06	2.24	1.10	1.74	0.16	0.53	0.26
80	4	0.22	0.01	0.28	0.36	0.47	0.38	0.12	0.11	0.22	0.24	0.16
	Mean	**0.21**	**0.15**	**0.46**	**0.39**	**0.51**	**0.74**	**0.42**	**0.48**	**0.25**	**0.21**	**0.19**
81	4	0.25	0.08	0.33	0.39	0.51	1.02	0.14	0.47	ns	ns	ns
82	**4**	0.29	0.01	0.81	0.42	0.44	0.51	0.47	0.43	0.33	0.56	0.26
83	4	0.25	0.02	0.06	0.21	1.06	2.41	1.51	0.90	0.66	ns	ns
84	4	0.19	0.01	0.80	0.45	0.73	0.65	0.51	0.76	0.38	0.40	0.38
85	4	0.31	0.01	0.54	0.29	0.46	0.50	0.28	0.29	0.49	0.66	0.54
86	4	0.22	0.01	0.05	0.41	0.78	1.13	0.75	1.44	1.53	1.52	0.87
87	4	1.04	0.05	0.74	0.53	0.67	1.21	0.95	0.66	0.53	0.60	0.49
88	4	ns	0.01	0.49	0.57	0.72	1.07	0.77	0.61	0.42	0.43	0.30
	Mean	**0.36**	**0.03**	**0.48**	**0.41**	**0.67**	**1.06**	**0.67**	**0.70**	**0.62**	**0.70**	**0.47**
89	4	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
90	4	ns	0.01	0.01	0.20	0.27	0.61	0.29	0.31	0.34	0.38	0.38
91	4	0.44	0.11	0.28	0.37	0.67	0.74	0.35	0.24	0.20	0.17	0.15
92	4	0.38	0.16	ns	0.46	0.89	1.19	0.40	0.30	0.16	ns	ns
93	4	0.21	0.01	0.04	0.53	0.63	0.65	0.22	0.13	ns	0.42	0.24
94	4	0.35	0.09	2.24	1.47	1.16	ns	1.70	0.97	0.18	1.00	0.45
95	4	0.25	0.50	1.48	0.66	1.17	0.68	0.39	0.36	0.29	0.23	0.20
96	4	ns	ns	0.37	0.47	0.72	0.62	0.54	0.59	0.44	0.47	0.32
	Mean	**0.33**	**0.15**	**0.74**	**0.59**	**0.79**	**0.75**	**0.56**	**0.41**	**0.27**	**0.45**	**0.29**
	Overall mean	**0.30**	**0.11**	**0.56**	**0.46**	**0.66**	**0.85**	**0.55**	**0.53**	**0.38**	**0.45**	**0.32**
Effective Rainfall (mm/wk)		40.50	2.24	0.34	5.66	0.00	0.00	51.14	4.04	0.00	0.00	3.23

Appendix 8…continued: Effect of treatment (Dirty water = 1; 2-Cut = 2; Grazed = 3; 1-Cut = 4) on NH_4-N concentrations (mg/l) for each cup and all treatments in the drainage year October 2001 to June 2002; Effective rainfall (mm/week) (Concentrations in red > MAC; ns = no sample).

Cup	Treatment	09/01/02	16/01/02	23/01/02	01/30/02	06/02/02	13/02/02	20/02/02	27/02/02	05/03/02	12/03/02	20/03/02
73	4	0.12	0.11	0.01	0.01	0.14	0.05	0.01	0.01	0.08	0.15	0.12
74	4	0.66	0.54	0.23	0.03	0.03	0.01	0.55	0.12	0.10	0.26	0.24
75	4	0.28	0.13	0.15	0.06	0.18	0.27	0.85	0.16	0.09	0.17	0.11
76	4	0.39	0.17	0.15	0.05	0.08	0.09	0.22	0.01	0.13	ns	ns
77	4	0.25	0.01	0.01	0.01	0.01	0.01	0.10	0.01	0.06	0.10	0.08
78	4	0.31	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.11	ns	ns
79	4	0.25	0.48	0.37	0.17	0.32	0.18	0.16	0.01	0.04	ns	0.06
80	4	0.25	0.21	0.17	0.01	0.01	0.01	0.12	0.01	0.02	0.04	0.05
	Mean	**0.31**	**0.21**	**0.14**	**0.04**	**0.10**	**0.08**	**0.25**	**0.04**	**0.08**	**0.14**	**0.11**
81	4	0.43	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.04	0.09	ns
82	**4**	0.24	0.38	0.36	0.14	0.01	0.01	0.26	0.01	0.03	0.07	0.04
83	4	1.29	0.60	1.41	0.59	0.45	0.46	0.01	0.01	0.08	0.10	0.10
84	4	0.78	0.35	0.23	0.04	0.01	0.01	0.59	0.01	0.05	0.05	0.04
85	4	0.58	0.77	0.41	0.17	0.02	0.01	0.01	0.20	0.22	ns	0.19
86	4	0.79	0.87	0.59	0.01	0.01	0.03	0.79	0.01	0.05	ns	ns
87	4	0.52	0.45	0.46	0.14	0.07	0.01	0.17	0.01	0.12	0.25	0.10
88	4	0.51	0.41	0.40	0.13	0.15	0.25	ns	1.21	0.12	0.24	0.21
	Mean	**0.64**	**0.48**	**0.48**	**0.15**	**0.09**	**0.10**	**0.26**	**0.18**	**0.09**	**0.13**	**0.11**
89	4	0.86	ns	ns	0.28	0.36	ns	ns	ns	3.35	ns	ns
90	4	0.56	0.38	0.28	0.10	0.03	ns	ns	ns	0.30	0.06	0.06
91	4	0.15	0.25	0.17	0.01	0.07	0.06	0.28	0.01	0.13	0.19	0.17
92	4	0.31	0.34	0.36	0.17	0.48	0.38	ns	ns	0.22	ns	ns
93	4	0.27	0.23	0.20	0.50	0.28	0.10	ns	1.45	0.39	0.64	0.20
94	4	0.64	0.54	0.41	0.09	0.01	0.01	0.01	0.01	0.05	0.07	0.09
95	4	0.47	0.35	1.05	0.09	ns	ns	ns	ns	ns	ns	0.07
96	4	0.36	0.73	0.38	0.01	0.00	ns	ns	0.01	0.02	0.13	0.52
	Mean	**0.45**	**0.40**	**0.41**	**0.16**	**0.18**	**0.14**	**0.15**	**0.37**	**0.64**	**0.22**	**0.19**
	Overall mean	**0.47**	**0.36**	**0.34**	**0.12**	**0.12**	**0.11**	**0.22**	**0.20**	**0.27**	**0.17**	**0.14**
Effective Rainfall (mm/wk)		35.62	10.40	44.22	35.88	63.88	14.39	0.51	22.86	7.99	13.65	5.74

Appendix 8…continued: Effect of treatment (Dirty water = 1; 2-Cut = 2; Grazed = 3; 1-Cut = 4) on NH_4-N concentrations (mg/l) for each cup and all treatments in the drainage year October 2001 to June 2002; Effective rainfall (mm/week) (Concentrations in red > MAC; ns = no sample).

Cup	Treatment	27/03/02	03/04/02	10/04/02	16/04/02	23/04/02	01/05/02	09/05/02	14/05/02	22/05/02	29/05/02	05/06/02
73	4	0.15	0.16	0.16	0.22	0.19	0.14	0.04	0.20	ns	0.14	0.08
74	4	1.16	ns	ns	0.33	0.04	0.02	0.04	0.21	0.23	0.07	0.06
75	4	0.13	0.09	ns	0.32	0.18	0.14	0.13	0.08	0.31	ns	0.10
76	4	0.27	0.17	ns	0.14	ns	ns	0.16	0.10	ns	0.48	0.16
77	4	0.11	0.12	0.16	0.19	0.15	0.15	0.26	0.18	0.17	0.12	0.08
78	4	0.24	ns	ns	ns	0.21	0.09	ns	0.39	0.44	0.10	0.12
79	4	0.05	0.03	ns	ns	ns	0.09	0.02	ns	ns	0.05	ns
80	4	0.05	0.03	0.03	0.02	0.04	0.00	ns	0.11	0.16	0.08	0.05
	Mean	**0.27**	**0.10**	**0.12**	**0.20**	**0.14**	**0.09**	**0.11**	**0.18**	**0.26**	**0.15**	**0.09**
81	4	ns	0.04	0.05	0.15	0.16	0.07	0.06	ns	ns	0.48	0.06
82	**4**	0.07	0.04	0.02	0.04	0.08	0.09	0.15	ns	ns	0.26	0.07
83	4	0.08	0.21	1.22	2.03	0.52	1.40	0.54	3.72	1.28	0.49	1.33
84	4	0.00	0.24	0.41	0.41	0.17	0.12	ns	ns	ns	ns	0.26
85	4	0.91	ns	ns	7.01	ns	1.82	0.67	0.33	ns	10.59	0.45
86	4	0.10	0.04	0.07	0.08	0.15	0.08	0.19	ns	ns	0.35	0.16
87	4	0.34	ns	ns	6.49	ns	ns	0.13	0.21	0.17	ns	ns
88	4	0.36	0.22	0.22	0.26	0.11	0.01	0.10	0.07	ns	ns	ns
	Mean	**0.27**	**0.13**	**0.33**	**2.06**	**0.20**	**0.51**	**0.26**	**1.08**	**0.73**	**2.43**	**0.39**
89	4	ns	3.34	ns	ns	12.26	ns	ns	ns	ns	0.40	0.28
90	4	0.08	0.05	0.10	0.45	ns	0.08	0.05	0.09	ns	ns	ns
91	4	0.16	0.04	0.08	0.18	0.19	0.07	0.10	0.17	0.17	0.14	0.11
92	4	0.07	ns	ns	ns	0.03	ns	0.09	ns	ns	0.11	ns
93	4	1.40	0.28	ns	0.90	0.35	0.24	0.42	0.39	0.26	0.19	ns
94	4	0.06	0.04	0.03	0.02	0.06	0.01	0.02	0.06	0.07	0.20	0.09
95	4	0.07	0.11	0.19	0.21	0.46	0.35	0.48	ns	ns	0.37	0.27
96	4	0.25	0.29	0.66	0.71	0.65	0.30	0.46	ns	0.62	0.26	ns
	Mean	**0.30**	**0.59**	**0.21**	**0.41**	**2.00**	**0.18**	**0.23**	**0.18**	**0.28**	**0.24**	**0.19**
	Overall mean	**0.28**	**0.27**	**0.22**	**0.89**	**0.78**	**0.26**	**0.20**	**0.48**	**0.42**	**0.94**	**0.22**
Effective Rainfall (mm/wk)		6.81	0.00	0.00	0.00	0.00	16.54	0.00	0.00	23.77	27.14	3.57

Appendix 9: Effect of treatment (Dirty water = 1; 2-Cut = 2; Grazed = 3; 1-Cut = 4) on NO_3-N concentrations (mg/l) for each cup and all treatments in the drainage year October 2002 to July 2003; Effective rainfall (mm/week) (Concentrations in red > MAC; ns = no sample).

Cup.	Treatment	30/10/02	06/11/02	13/11/02	20/11/02	27/11/02	04/12/02	11/12/02	18/12/02	24/12/02	02/01/03	09/01/03	15/01/03	22/01/03
1	1	ns	ns	0.79	0.52	0.50	0.70	0.91	1.15	1.31	1.28	1.62	0.00	2.02
2	1	11.18	29.33	41.83	63.56	113.50	120.28	93.37	73.84	56.01	44.05	33.04	27.91	23.54
3	1	ns	0.16	0.48	0.34	0.35	3.23	0.59	1.26	ns	2.46	ns	ns	ns
4	1	0.67	1.73	2.15	4.33	5.61	7.11	6.14	6.69	6.56	6.78	7.66	ns	7.91
5	1	3.05	ns	ns	ns	ns	160.59	172.13	172.99	ns	99.78	61.44	ns	59.67
6	1	ns	ns	5.88	ns	8.27	ns	13.41	ns	ns	18.88	ns	ns	ns
7	1	ns	2.13	2.91	4.41	5.54	6.42	5.43	6.12	5.94	6.24	6.83	0.00	5.92
8	1	2.10	1.90	1.99	2.79	2.76	3.84	2.88	ns	ns	5.48	ns	ns	9.35
	Mean	**4.25**	**7.05**	**8.00**	**12.66**	**19.50**	**43.17**	**36.86**	**43.68**	**17.46**	**23.12**	**22.12**	**9.30**	18.07
9	1	ns	1.78	1.49	1.40	1.86	1.80	1.58	1.74	2.77	3.13	4.15	3.27	ns
10	1	ns	1.57	1.11	1.20	0.82	0.57	0.63	0.89	0.73	0.97	1.07	1.16	0.00
11	1	6.36	6.02	0.00	5.50	5.87	6.45	6.22	6.61	6.76	7.04	8.23	7.75	7.76
12	1	2.47	3.00	2.55	2.30	1.94	2.33	2.50	2.53	ns	2.44	2.45	2.46	2.46
13	1	1.00	1.48	0.00	1.68	2.50	2.33	2.68	2.95	3.19	3.14	3.33	3.09	3.18
14	1	1.52	1.64	1.05	1.03	1.14	0.80	0.98	0.11	ns	1.26	1.28	ns	1.83
15	1	ns	8.19	9.32	8.78	9.15	8.95	9.00	9.95	9.36	8.72	ns	ns	ns
16	1	0.70	0.37	0.30	0.81	1.21	2.97	2.16	2.08	1.84	4.58	ns	4.27	ns
	Mean	**2.41**	**3.01**	**1.98**	**2.84**	**3.06**	**3.28**	**3.22**	**3.36**	**4.11**	**3.91**	**3.42**	**3.67**	3.05
17	1	7.71	6.81	6.26	5.82	6.63	7.63	8.70	ns	8.04	7.82	4.96	6.96	7.09
18	1	7.43	5.42	5.10	5.34	6.91	6.38	6.43	7.73	ns	9.19	ns	ns	9.70
19	1	ns	ns	1.16	1.25	1.33	1.35	1.32	1.51	1.50	1.62	ns	ns	1.88
20	1	3.79	2.67	3.14	3.27	2.90	3.54	3.56	4.02	3.97	3.81	ns	ns	5.04
21	1	3.31	2.58	1.90	1.86	2.31	2.84	2.80	2.58	ns	2.64	ns	3.37	3.04
22	1	3.89	1.63	1.19	1.52	4.16	31.26	55.37	64.30	ns	75.61	64.90	61.90	50.42
23	1	ns	ns	5.49	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
24	1	3.69	3.30	2.53	2.41	2.73	3.28	2.39	2.63	2.73	2.67	2.42	2.71	2.44
	Mean	**4.97**	**3.74**	**3.35**	**3.07**	**3.85**	**8.04**	**11.51**	**13.80**	**4.06**	**14.77**	**24.09**	**18.74**	11.37
Overall mean		**3.88**	**4.60**	**4.44**	**6.19**	**8.81**	**18.16**	**17.20**	**20.28**	**8.54**	**13.93**	**16.54**	**10.57**	**10.83**
Effective Rainfall (mm/wk)		57.99	21.98	13.38	15.06	98.73	17.60	5.02	0.00	47.77	36.75	0.66	1.12	40.11

Appendix 9..continued: Effect of treatment (Dirty water = 1; 2-Cut = 2; Grazed = 3; 1-Cut = 4) on NO_3-N concentrations (mg/l) for each cup and all treatments in the drainage year October 2002 to July 2003; Effective rainfall (mm/week) (Concentrations in red > MAC; ns = no sample).

Cup.	Treatment	29/01/03	05/02/03	12/02/03	19/02/03	26/02/03	05/03/03	12/03/03	19/03/03	26/03/03	02/04/03	09/04/03	16/04/03
1	1	1.99	2.09	2.10	ns	2.30	2.10	2.30	ns	ns	ns	ns	ns
2	1	20.71	17.74	16.28	15.90	16.6	15.1	14.5	13.80	14.30	3.64	15.30	12.70
3	1	3.83	3.54	3.27	2.20	1.90	0.60	ns	ns	ns	ns	ns	ns
4	1	ns	ns	8.79	9.00	9.30	8.60	ns	ns	ns	ns	ns	ns
5	1	33.97	27.90	16.37	10.60	9.10	ns	ns	ns	ns	7.90	23.3	21.19
6	1	22.80	24.99	22.91	ns	ns	ns	ns	ns	ns	ns	ns	ns
7	1	ns	5.51	5.62	ns	ns	2.90	2.40	ns	ns	ns	ns	ns
8	1	9.35	ns	9.89	10.50	ns	ns	ns	ns	ns	ns	ns	ns
	Mean	**15.44**	**13.63**	**10.65**	**9.64**	**7.84**	**5.86**	**6.40**	**13.80**	**14.30**	**5.77**	**19.30**	**16.95**
9	1	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
10	1	0.84	0.70	1.34	0.50	0.60	0.20	ns	ns	ns	ns	ns	ns
11	1	7.42	7.71	8.49	8.10	8.20	7.80	ns	ns	ns	ns	ns	ns
12	1	ns	ns	2.68	ns	ns	ns	ns	ns	ns	ns	ns	ns
13	1	3.46	3.53	3.75	3.30	3.60	3.40	3.70	ns	ns	3.88	4.78	4.60
14	1	ns	ns	2.32	ns	ns	ns	2.40	ns	ns	ns	ns	ns
15	1	ns	ns	6.74	6.10	5.80	5.40	4.90	ns	ns	ns	ns	ns
16	1	ns	ns	4.72	4.30	4.80	4.20	ns	ns	ns	ns	ns	ns
	Mean	**3.91**	**3.98**	**4.29**	**4.46**	**4.60**	**4.20**	**3.67**	**ns**	**ns**	**3.88**	**4.78**	**4.60**
17	1	7.51	7.65	7.46	6.60	ns	ns	ns	ns	ns	ns	ns	6.77
18	1	9.57	9.66	9.26	ns	ns	ns	ns	ns	ns	ns	ns	ns
19	1	ns	ns	1.90	ns	ns	ns	ns	ns	ns	ns	ns	ns
20	1	ns	4.49	4.35	ns	ns	ns	ns	ns	ns	ns	ns	ns
21	1	3.22	3.26	3.32	ns	ns	3.20	ns	ns	ns	ns	ns	ns
22	1	46.53	34.93	29.73	23.70	18.6	15.70	ns	ns	ns	ns	ns	ns
23	1	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
24	1	2.64	2.66	2.65	2.30	2.50	2.00	ns	ns	ns	ns	ns	ns
	Mean	**13.89**	**10.44**	**8.38**	**10.87**	**10.55**	**6.97**	**ns**	**ns**	**ns**	**ns**	**ns**	**6.77**
Overall mean		**11.08**	**9.35**	**7.78**	**8.32**	**7.66**	**5.68**	**5.03**	**13.8**	**14.3**	**4.83**	**12.04**	**9.44**
Effective Rainfall (mm/wk)		5.06	11.85	17.18	0.00	5.62	29.25	29.78	0.00	0.00	0.00	0.00	0.00

Appendix 9...continued: Effect of treatment (Dirty water = 1; 2-Cut = 2; Grazed = 3; 1-Cut = 4) on NO_3-N concentrations (mg/l) for each cup and all treatments in the drainage year October 2002 to July 2003; Effective rainfall (mm/week) (Concentrations in red > MAC; ns = no sample).

Cup.	Treatment	23/04/03	30/04/03	07/05/03	14/05/03	21/05/03	28/05/03	04/06/03	11/06/03	18/06/03	25/06/03	02/07/03	09/07/03
1	1	ns	3.27	ns	2.02	4.52	ns	ns	ns	ns	ns	ns	ns
2	1	12.11	11.77	10.21	10.53	9.77	9.68	7.58	5.66	5.42	3.30	1.26	0.54
3	1	ns	ns	ns	ns	ns	0.26	0.31	0.27	0.15	0.31	ns	ns
4	1	ns	ns	ns	ns	ns	1.21	0.98	1.47	1.03	0.81	ns	ns
5	1	20.69	17.54	7.01	ns	ns	2.15	2.34	3.34	1.18	1.07	1.78	2.83
6	1	ns	ns	3.90	2.86	3.45	2.41	ns	1.13	4.19	ns	ns	ns
7	1	ns	ns	1.61	ns	2.16	1.52	1.40	1.59	1.23	0.78	0.00	0.93
8	1	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
	Mean	**16.40**	**10.86**	**5.68**	**5.14**	**4.98**	**2.87**	**2.52**	**2.24**	**2.20**	**1.25**	**1.01**	**1.43**
9	1	ns	ns	4.81	5.08	4.00	2.22	1.51	1.20	0.57	0.48	ns	ns
10	1	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
11	1	ns	ns	5.90	5.50	5.44	4.96	4.95	5.05	4.42	ns	3.47	ns
12	1	ns	ns	3.59	2.72	2.19	ns	ns	ns	ns	ns	ns	ns
13	1	4.70	4.59	4.91	5.01	5.07	5.48	5.17	5.77	4.97	5.12	ns	4.96
14	1	ns	ns	2.94	ns	ns	ns	ns	ns	4.02	ns	5.71	ns
15	1	ns	ns	ns	ns	ns	ns	ns	2.85	2.87	2.04	1.73	2.16
16	1	ns	ns	2	1.14	0.56	0.23	0.70	0.37	0.00	0.00	0.17	0.29
	Mean	**4.70**	**4.59**	**4.03**	**3.89**	**3.45**	**3.22**	**3.08**	**3.05**	**2.81**	**1.91**	**2.77**	**2.47**
17	1	7.89	8.01	8.30	7.51	7.47	7.86	7.14	6.97	7.14	ns	ns	ns
18	1	ns	ns	10.22	9.14	8.12	6.67	5.85	5.24	4.51	ns	ns	ns
19	1	ns	ns	1.43	1.24	0.99	0.88	0.74	0.84	0.60	ns	0.73	ns
20	1	ns	ns	2.04	1.48	1.31	1.05	0.70	0.47	0.00	1.34	ns	0.40
21	1	ns	ns	2.75	3.36	2.80	2.69	2.38	2.52	1.66	ns	0.91	0.74
22	1	Ns	ns	ns	ns	ns	0.42	0.36	0.36	0.13	ns	0.13	0.00
23	1	Ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
24	1	Ns	ns	1.69	2.21	2.01	2.36	2.02	1.93	1.70	1.75	1.36	1.25
	Mean	**7.89**	**8.01**	**4.41**	**4.16**	**3.78**	**3.13**	**2.74**	**2.62**	**2.25**	**1.55**	**0.78**	**0.60**
	Overall mean	**9.66**	**7.82**	**4.70**	**4.39**	**4.07**	**3.08**	**2.78**	**2.64**	**2.42**	**1.57**	**1.52**	**1.50**
Effective Rainfall (mm/wk)		0.00	17.97	36.55	0.00	0.00	0.00	0.00	29.42	0.00	0.00	0.00	0.00

Appendix 9...continued.: Effect of treatment (Dirty water = 1; 2-Cut = 2; Grazed = 3; 1-Cut = 4) on NO_3-N concentrations (mg/l) for each cup and all treatments in the drainage year October 2002 to July 2003; Effective rainfall (mm/week) (Concentrations in red > MAC; ns = no sample).

Cup	Treatment	30/10/02	06/11/02	13/11/02	20/11/02	27/11/02	04/12/02	11/12/02	18/12/02	24/12/02	02/01/03	09/01/03	15/01/03	22/01/03
25	2	5.14	3.62	1.72	3.31	2.01	2.12	2.20	ns	ns	2.85	ns	ns	ns
26	2	4.57	5.03	7.22	11.92	7.27	4.92	6.87	8.08	6.68	1.76	ns	2.90	3.77
27	2	0.69	0.14	0.00	0.00	0.13	0.66	1.43	1.50	1.82	1.47	1.91	ns	3.15
28	2	ns	9.07	9.30	7.14	6.05	5.28	4.77	4.58	4.46	4.93	3.71	5.45	5.47
29	2	22.42	ns	14.14	9.84	9.23	0.00	7.00	6.03	4.95	4.48	3.45	2.29	3.5
30	2	1.42	0.53	0.00	0.40	0.36	ns	0.81	ns	ns	1.58	1.23	ns	ns
31	2	0.32	0.79	0.63	1.00	1.13	1.32	1.35	0.55	ns	1.35	ns	ns	ns
32	2	12.34	7.64	5.33	4.50	4.13	ns	3.45	3.19	ns	3.25	ns	ns	ns
	Mean	**6.70**	**3.83**	**4.79**	**4.76**	**3.79**	**2.39**	**3.49**	**3.99**	**4.48**	**2.71**	**2.58**	**3.55**	**3.97**
33	2	ns	ns	ns	ns	9.34	9.38	7.60	ns	ns	6.27	ns	7.18	6.32
34	2	ns	ns	ns	8.68	7.56	6.02	2.88	4.44	ns	3.76	ns	4.09	4.61
35	2	5.65	6.38	7.35	8.31	9.18	9.32	9.00	8.67	ns	7.05	4.53	7.28	6.85
36	2	1.59	1.76	1.54	1.37	1.45	1.77	1.49	1.67	ns	1.60	ns	ns	1.61
37	2	1.67	1.03	0.59	1.02	1.13	1.20	1.54	1.79	2.06	2.28	2.22	2.64	2.48
38	2	1.38	1.40	1.21	1.48	1.75	2.64	3.12	3.80	ns	2.49	ns	ns	2.58
39	2	ns	0.00	2.25	1.92	1.61	1.49	1.64	1.87	2.15	2.25	2.27	2.97	3.17
40	2	ns	4.81	ns	5.62	6.51	5.96	5.58	5.21	ns	ns	ns	ns	ns
	Mean	**2.57**	**2.56**	**2.59**	**4.06**	**4.82**	**4.72**	**4.11**	**3.92**	**2.11**	**3.67**	**3.01**	**4.83**	**3.95**
41	2	2.12	2.29	1.93	1.98	1.88	2.17	2.00	1.67	1.89	1.69	1.61	1.90	1.88
42	2	ns	0.82	0.67	1.23	1.21	ns	1.06	ns	ns	1.79	1.33	ns	ns
43	2	ns	5.86	6.20	5.69	6.55	6.33	6.43	6.05	ns	5.81	ns	ns	5.16
44	2	0.80	0.77	1.05	ns	2.28	1.92	1.86	1.67	ns	1.59	ns	ns	1.67
45	2	3.06	3.10	2.98	3.08	3.00	2.61	2.98	3.07	3.05	2.88	2.54	2.92	2.79
46	2	15.73	8.68	0.00	6.79	5.57	5.94	5.02	5.42	5.64	4.81	ns	ns	ns
47	2	4.10	3.59	ns	3.18	2.87	1.61	1.27	1.32	0.99	0.62	ns	ns	ns
48	2	0.16	0.24	0.00	0.17	0.00	0.00	0.00	0.17	0.14	0.15	ns	ns	0.11
	Mean	**4.33**	**3.17**	**1.83**	**3.16**	**2.92**	**2.94**	**2.58**	**2.77**	**2.34**	**2.42**	**1.83**	**2.41**	**2.32**
	Overall mean	**4.53**	**3.19**	**3.07**	**3.99**	**3.84**	**3.35**	**3.39**	**3.56**	**2.97**	**2.93**	**2.47**	**3.60**	**3.41**
Effective Rainfall (mm/wk)		57.99	21.98	13.38	15.06	98.73	17.60	5.02	0.00	47.77	36.75	0.66	1.12	40.11

Appendix 9...continued: Effect of treatment (Dirty water = 1; 2-Cut = 2; Grazed = 3; 1-Cut = 4) on NO_3-N concentrations (mg/l) for each cup and all treatments in the drainage year October 2002 to July 2003; Effective rainfall (mm/week) (Concentrations in red > MAC; ns = no sample).

Cup.	Treatment	29/01/03	05/02/03	12/02/03	19/02/03	26/02/03	05/03/03	12/03/03	19/03/03	26/03/03	02/04/03	09/04/03	16/04/03
25	2	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
26	2	1.69	1.74	18.54	10.70	ns	11.30	10.5	ns	ns	ns	ns	ns
27	2	1.81	1.96	1.72	1.40	ns	2.50	1.70	1.90	2.00	ns	3.30	3.54
28	2	5.25	5.39	5.67	ns	8.10	6.10	7.30	ns	ns	ns	ns	ns
29	2	1.41	2.81	4.21	3.60	ns	5.80	5.40	ns	ns	ns	ns	ns
30	2	ns	ns	1.19	ns	ns	ns	ns	ns	ns	ns	ns	ns
31	2	ns	ns	0.64	0.80	0.80	ns	ns	ns	ns	ns	ns	ns
32	2	ns	4.87	4.25	3.50	3.60	3.70	ns	ns	ns	ns	ns	ns
	Mean	**2.54**	**3.35**	**5.17**	**4.00**	**4.17**	**5.88**	**6.23**	**1.90**	**2.00**	**ns**	**ns**	**3.54**
33	2	6.28	6.04	5.94	5.10	5.30	5.20	5.10	ns	ns	ns	ns	ns
34	2	5.01	4.31	3.90	3.20	3.50	3.40	ns	ns	ns	ns	ns	2.45
35	2	7.35	8.15	10.14	17.10	25.5	31.9	38.5	ns	ns	51.28	ns	62.89
36	2	1.80	1.70	1.69	1.40	1.60	ns	ns	ns	ns	ns	ns	ns
37	2	2.95	2.90	2.79	2.40	2.80	3.10	3.10	ns	ns	ns	ns	4.08
38	2	4.61	5.04	4.92	4.40	4.60	4.60	5.10	ns	ns	ns	ns	6.41
39	2	3.01	2.95	2.85	2.70	2.80	3.50	ns	ns	ns	ns	ns	ns
40	2	ns	ns	ns	1.50	ns	7.60	ns	ns	ns	ns	ns	ns
	Mean	**4.43**	**4.44**	**4.60**	**4.73**	**6.59**	**8.47**	**12.95**	**ns**	**ns**	**51.28**	**ns**	**18.96**
41	2	1.81	1.77	1.73	ns	1.40	ns	ns	ns	ns	ns	ns	ns
42	2	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
43	2	ns	3.23	4.17	3.20	3.40	4.30	ns	ns	ns	2.10	ns	ns
44	2	0.58	0.55	0.66	0.70	ns	ns	1.70	ns	ns	ns	ns	ns
45	2	2.98	2.95	2.66	2.60	2.60	2.50	2.40	2.60	2.20	2.71	2.97	2.95
46	2	ns	ns	ns	ns	ns	6.50	4.40	ns	5.10	4.81	ns	ns
47	2	ns	ns	ns	ns	ns	ns	0.00	0.10	0.00	0.22	0.00	0.11
48	2	0.00	ns	0.00	ns	ns	ns	ns	ns	ns	ns	ns	ns
	Mean	**1.34**	**2.13**	**1.84**	**2.17**	**2.47**	**4.43**	**2.13**	**1.35**	**2.43**	**2.46**	**1.49**	**1.53**
	Overall mean	**2.77**	**3.31**	**3.87**	**3.63**	**4.41**	**6.26**	**7.10**	**1.63**	**2.22**	**26.87**	**2.39**	**8.01**
Effective Rainfall (mm/wk)		5.06	11.85	17.18	0.00	5.62	29.25	29.78	0.00	0.00	0.00	0.00	0.00

Appendix 9...continued: Effect of treatment (Dirty water = 1; 2-Cut = 2; Grazed = 3; 1-Cut = 4) on NO_3-N concentrations (mg/l) for each cup and all treatments in the drainage year October 2002 to July 2003; Effective rainfall (mm/week) (Concentrations in red > MAC; ns = no sample).

Cup.	Treatment	23/04/03	30/04/03	07/05/03	14/05/03	21/05/03	28/05/03	04/06/03	11/06/03	18/06/03	25/06/03	02/07/03	09/07/03
25	2	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
26	2	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
27	2	2.73	2.94	2.25	2.36	ns	ns	3.51	2.99	2.54	2.33	3.3	ns
28	2	ns	ns	10.90	ns	ns	ns	ns	ns	ns	ns	ns	ns
29	2	ns	ns	10.55	10.62	9.88	10.90	ns	ns	ns	ns	10.10	7.81
30	2	ns	ns	3.01	ns	ns	ns	ns	1.05	ns	ns	3.36	ns
31	2	ns	ns	0.51	ns	0.51	0.42	0.71	1.06	ns	ns	ns	ns
32	2	ns	ns	10.20	ns	ns	ns	ns	ns	ns	ns	ns	ns
	Mean	**2.73**	**2.94**	**6.24**	**6.49**	**5.20**	**5.66**	**2.11**	**1.70**	**2.54**	**2.33**	**5.59**	**7.81**
33	2	ns	5.90	ns	ns	6.44	7.94	ns	6.33	ns	ns	ns	ns
34	2	2.83	2.49	ns	ns	3.73	2.60	ns	ns	ns	ns	ns	1.87
35	2	64.02	66.12	60.87	59.13	53.22	39.04	28.42	47.01	47.18	45.15	12.57	1.89
36	2	ns	2.93	3.05	ns	2.02	2.00	1.87	1.45	1.34	1.03	ns	0.61
37	2	3.5	2.86	2.39	1.27	1.04	0.73	0.94	1.35	1.51	1.42	1.33	1.21
38	2	7.29	7.25	ns	ns	6.71	6.64	5.45	5.08	6.91	6.59	ns	ns
39	2	ns	ns	ns	ns	5.61	ns	ns	ns	ns	ns	ns	ns
40	2	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
	Mean	**19.41**	**14.59**	**22.10**	**30.20**	**11.25**	**9.83**	**9.17**	**12.24**	**14.24**	**13.55**	**6.95**	**1.40**
41	2	ns	1.68	1.24	0.66	0.44	0.26	0.53	0.40	0.41	0.57	0.81	0.91
42	2	ns	ns	0.48	ns	ns	ns	ns	ns	1.57	ns	ns	ns
43	2	2.76	3.15	3.56	3.95	ns	ns	ns	4.82	ns	ns	ns	ns
44	2	ns	ns	2.61	ns	ns	1.67	1.23	1.15	1.01	ns	ns	ns
45	2	2.71	2.96	0.00	2.79	2.53	2.38	2.09	2.10	2.12	2.22	2.97	2.92
46	2	ns	ns	7.75	ns	ns	ns	ns	8.41	6.76	5.50	6.58	6.64
47	2	0.00	0.15	0.00	0.00	0.00	0.00	0.17	0.41	0.46	0.61	0.83	0.86
48	2	ns	ns	0.00	0.12	0.00	0.00	0.15	ns	ns	ns	ns	ns
	Mean	**1.82**	**1.99**	**1.96**	**1.50**	**0.74**	**0.86**	**0.83**	**2.88**	**2.06**	**2.23**	**2.80**	**2.83**
	Overall mean	**7.99**	**6.51**	**10.10**	**12.73**	**5.73**	**5.45**	**4.04**	**5.61**	**6.28**	**6.03**	**5.11**	**4.01**
Effective Rainfall (mm/wk)		0.00	17.97	36.55	0.00	0.00	0.00	0.00	29.42	0.00	0.00	0.00	0.00

Appendix 9...continued: Effect of treatment (Dirty water = 1; 2-Cut = 2; Grazed = 3; 1-Cut = 4) on NO_3-N concentrations (mg/l) for each cup and all treatments in the drainage year October 2002 to July 2003; Effective rainfall (mm/week) (Concentrations in red > MAC; ns = no sample).

Cup.	Treatment	30/10/02	06/11/02	13/11/02	20/11/02	27/11/02	04/12/02	11/12/02	18/12/02	24/12/02	02/01/03	09/01/03	15/01/03	22/01/03
49	3	7.61	6.75	0.00	6.16	5.63	5.38	4.73	ns	ns	4.49	ns	ns	ns
50	3	5.61	5.28	4.99	4.38	4.18	3.96	3.35	3.40	ns	3.50	ns	3.17	3.06
51	3	1.13	0.94	0.90	1.33	1.26	1.50	1.89	2.20	2.36	2.63	2.60	3.05	2.96
52	3	14.42	8.99	5.93	4.75	3.82	3.23	2.91	2.87	ns	3.13	ns	ns	ns
53	3	0.00	0.00	0.00	ns	0.00	ns	0.00	0.24	0.41	0.37	1.34	ns	ns
54	3	2.33	2.88	2.02	1.52	1.91	2.64	2.80	ns	ns	3.49	ns	ns	3.93
55	3	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
56	3	8.29	4.48	2.39	1.04	0.30	0	0.00	0.00	2.34	1.14	0.29	0.00	2.12
	Mean	**5.63**	**4.19**	**2.32**	**3.19**	**2.44**	**2.78**	**2.24**	**1.74**	**1.70**	**2.68**	**1.41**	**2.07**	**3.02**
57	3	2.57	1.38	1.05	1.58	1.40	ns	2.04	1.71	ns	2.99	ns	ns	4.01
58	3	ns	ns	ns	ns	ns	ns	ns	ns	ns	2.55	2.00	ns	ns
59	3	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
60	3	0.00	ns	0.20	0.56	0.00	ns	0.66	0.78	ns	1.02	ns	ns	0.69
61	3	2.28	1.34	1.05	1.34	1.30	1.14	1.23	1.41	ns	1.79	ns	ns	2.48
62	3	0.00	0.00	0.00	0.23	0.00	0.00	0.22	0.52	0.59	0.55	0.74	0.70	0.69
63	3	0.47	ns	0.42	1.13	0.58	0.83	1.03	1.26	ns	1.56	ns	ns	ns
64	3	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
	Mean	**1.06**	**0.91**	**0.54**	**0.97**	**0.66**	**0.66**	**1.04**	**1.14**	**0.59**	**1.74**	**1.37**	**0.70**	**1.97**
65	3	1.00	0.96	0.73	0.93	0.89	1.09	1.43	ns	2.09	1.89	1.82	ns	2.52
66	3	1.49	1.94	1.78	2.04	1.92	1.92	1.90	ns	ns	2.42	ns	ns	2.47
67	3	ns	1.64	ns	ns	3.14	3.54	ns	ns	ns	5.00	3.89	ns	ns
68	3	0.24	0.30	0.17	0.33	0.20	0.11	0.17	0.39	0.49	0.47	0.58	0.49	0.38
69	3	2.46	2.34	2.22	2.53	2.77	3.10	3.27	ns	ns	3.81	ns	4.46	3.89
70	3	0.79	1.47	1.91	4.55	6.62	10.06	12.26	ns	13.30	8.91	ns	ns	ns
71	3	2.93	1.93	2.07	2.64	1.97	1.97	2.23	2.16	2.46	2.55	2.94	3.40	2.9
72	3	3.21	2.74	ns	3.72	3.63	3.35	3.66	3.16	ns	3.46	ns	ns	2.65
	Mean	**1.73**	**1.67**	**1.48**	**2.39**	**2.64**	**3.14**	**3.56**	**1.90**	**4.59**	**3.56**	**2.31**	**2.78**	**2.47**
	Overall mean	**2.81**	**2.25**	**1.45**	**2.18**	**1.91**	**2.19**	**2.28**	**1.59**	**2.29**	**2.66**	**1.70**	**1.85**	**2.48**
Effective Rainfall (mm/wk)		57.99	21.98	13.38	15.06	98.73	17.60	5.02	0.00	47.77	36.75	0.66	1.12	40.11

Appendix 9...continued: Effect of treatment (Dirty water = 1; 2-Cut = 2; Grazed = 3; 1-Cut = 4) on NO_3-N concentrations (mg/l) for each cup and all treatments in the drainage year October 2002 to July 2003; Effective rainfall (mm/week) (Concentrations in red > MAC; ns = no sample).

Cup.	Treatment	29/01/03	05/02/03	12/02/03	19/02/03	26/02/03	05/03/03	12/03/03	19/03/03	26/03/03	02/04/03	09/04/03	16/04/03
49	3	ns	ns	ns	ns	ns	ns	3.90	ns	ns	ns	ns	ns
50	3	3.38	3.43	3.29	2.90	2.90	3.10	3.30	ns	ns	ns	ns	ns
51	3	3.06	ns	3.10	ns	ns	4.40	ns	ns	ns	ns	ns	ns
52	3	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
53	3	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
54	3	3.93	3.87	3.55	ns	ns	ns	ns	ns	ns	ns	ns	ns
55	3	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
56	3	0.81	2.69	2.00	0.40	1.40	1.10	ns	ns	0.00	0.29	0.50	1.68
	Mean	**2.80**	**3.33**	**2.99**	**1.65**	**2.15**	**2.87**	**3.60**	**ns**	**0.00**	**0.29**	**0.50**	**1.68**
57	3	3.95	4.74	ns	ns	3.20	ns	4.00	ns	ns	ns	ns	ns
58	3	ns	3.83	2.60	1.70	1.80	2.00	1.80	1.70	ns	ns	ns	4.29
59	3	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
60	3	ns	ns	1.72	1.10	1.00	0.9	ns	ns	ns	ns	ns	ns
61	3	2.04	1.63	1.39	ns	0.50	1.4	1.40	ns	ns	ns	ns	ns
62	3	0.57	0.96	0.59	0.60	ns	0.4	0.30	ns	ns	ns	ns	ns
63	3	ns	ns	1.10	1.20	0.90	ns	ns	ns	ns	ns	ns	ns
64	3	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
	Mean	**2.19**	**2.79**	**1.48**	**1.15**	**1.48**	**1.18**	**1.88**	**1.70**	**ns**	**ns**	**ns**	**4.29**
65	3	2.34	2.51	2.25	ns	ns	2.00	ns	ns	ns	ns	ns	ns
66	3	1.81	1.23	1.00	ns	ns	ns	ns	ns	ns	ns	ns	ns
67	3	3.55	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
68	3	0.22	0.13	0.24	0.00	ns	0.10	0.00	0.00	0.00	0.47	0.25	0.16
69	3	4.16	4.26	4.06	ns	ns	ns	4.3	ns	ns	ns	ns	ns
70	3	ns	6.03	7.56	8.50	11.30	13.50	20.20	ns	ns	ns	ns	ns
71	3	2.94	2.76	2.59	ns	ns	ns	2.50	ns	ns	ns	ns	ns
72	3	ns	0.00	ns	ns	ns	ns	ns	0.00	ns	ns	ns	ns
	Mean	**2.50**	**2.42**	**2.95**	**4.25**	**11.30**	**5.20**	**6.75**	**0.00**	**0.00**	**0.47**	**0.25**	**0.16**
	Overall mean	**2.50**	**2.85**	**2.47**	**2.35**	**4.98**	**3.08**	**4.07**	**0.85**	**0.00**	**0.38**	**0.37**	**2.04**
Effective Rainfall (mm/wk)		5.06	11.85	17.18	0.00	5.62	29.25	29.78	0.00	0.00	0.00	0.00	0.00

Appendix 9...continued: Effect of treatment (Dirty water = 1; 2-Cut = 2; Grazed = 3; 1-Cut = 4) on NO_3-N concentrations (mg/l) for each cup and all treatments in the drainage year October 2002 to July 2003; Effective rainfall (mm/week) (Concentrations in red > MAC; ns = no sample).

Cup.	Treatment	23/04/03	30/04/03	07/05/03	14/05/03	21/05/03	28/05/03	04/06/03	11/06/03	18/06/03	25/06/03	02/07/03	09/07/03
49	3	ns	ns	6.60	ns	5.65	ns	5.00	3.60	1.65	3.33	4.61	4.76
50	3	ns	ns	6.05	4.90	4.79	ns	4.26	3.82	3.06	2.68	2.38	1.82
51	3	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
52	3	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
53	3	ns	ns	ns	ns	ns	ns	ns	2.09	1.96	ns	ns	0.00
54	3	ns	ns	3.03	ns	ns	4.38	ns	3.45	3.60	ns	ns	ns
55	3	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
56	3	1.36	1.37	0.00	0.00	0.00	0.00	1.49	0.11	0.00	0.00	0.00	0.00
	Mean	**1.36**	**1.37**	**3.92**	**2.45**	**3.48**	**2.19**	**3.58**	**2.61**	**2.05**	**2.00**	**2.33**	**1.65**
57	3	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	5.19	ns
58	3	2.85	2.2	1.66	1.59	1.11	1.14	1.14	0.67	0.42	0.18	0.88	0.44
59	3	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
60	3	ns	ns	1.27	ns	0.55	0.52	0.44	0.00	ns	ns	ns	ns
61	3	ns	ns	ns	0.61	0.38	0.35	ns	0.33	0.18	ns	ns	ns
62	3	ns	ns	0.00	ns	ns	ns	ns	0.17	0.00	0.00	0.00	0.00
63	3	ns	ns	1.37	ns	ns	1.89	ns	ns	ns	ns	ns	ns
64	3	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
	Mean	**2.85**	**2.20**	**1.08**	**1.10**	**0.68**	**0.98**	**0.79**	**0.29**	**0.20**	**0.09**	**2.02**	**0.22**
65	3	ns	ns	4.53	3.75	ns	2.45	ns	0.60	0.20	ns	0.51	ns
66	3	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
67	3	ns	ns	ns	ns	ns	4.49	3.35	3.09	2.68	ns	ns	ns
68	3	0.00	0.26	0.13	0.00	0.13	0.27	ns	0.39	0.00	0.34	0.35	0.00
69	3	ns	ns	3.8	ns	ns	ns	3.27	2.56	1.89	1.3	1.11	0.86
70	3	ns	ns	9.94	0.38	ns	10.43	ns	ns	0.33	ns	ns	ns
71	3	ns	19.14	0.60	ns	0.16	0.10	0.27	0.18	0.00	0.00	0.00	0.00
72	3	ns	7.02	7.25	ns	9.02	ns	ns	9.16	10.06	ns	ns	ns
	Mean	**0.00**	**8.81**	**4.38**	**1.38**	**3.10**	**3.55**	**2.30**	**2.66**	**2.17**	**0.55**	**0.49**	**0.29**
	Overall mean	**1.40**	**4.13**	**3.12**	**1.64**	**2.42**	**2.24**	**2.22**	**1.86**	**1.47**	**0.88**	**1.62**	**0.72**
Effective Rainfall (mm/wk)		0.00	17.97	36.55	0.00	0.00	0.00	0.00	29.42	0.00	0.00	0.00	0.00

Appendix 9...continued: Effect of treatment (Dirty water = 1; 2-Cut = 2; Grazed = 3; 1-Cut = 4) on NO_3-N concentrations (mg/l) for each cup and all treatments in the drainage year October 2002 to July 2003; Effective rainfall (mm/week) (Concentrations in red > MAC; ns = no sample).

Cup.	Treatment	30/10/02	06/11/02	13/11/02	20/11/02	27/11/02	04/12/02	11/12/02	18/12/02	24/12/02	02/01/03	09/01/03	15/01/03	22/01/03
73	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.21	0.46	0.32	0.33
74	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.18	0.00	0.00
75	4	1.48	1.98	1.67	1.79	1.24	0.88	1.22	ns	ns	1.91	2.43	2.70	3.20
76	4	0.00	0.00	0.00	0.13	0.00	0.00	0.00	ns	ns	0.13	ns	ns	0.14
77	4	0.00	0.00	0.00	0.16	0.00	0.00	0.00	0.00	0.11	0.00	0.32	0.00	0.00
78	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	ns	0.18	0.14	0.25	ns	0.16
79	4	ns	ns	0.00	0.33	0.00	0.00	0.19	ns	ns	0.33	0.79	0.22	0.00
80	4	0.00	0.00	0.00	0.26	0.00	0.29	0.12	0.32	0.42	0.26	ns	ns	0.49
	Mean	**0.21**	**0.28**	**0.21**	**0.33**	**0.16**	**0.15**	**0.19**	**0.08**	**0.14**	**0.37**	**0.74**	**0.65**	**0.54**
81	4	ns	ns	ns	ns	ns	ns	2.25	3.76	ns	3.76	ns	ns	ns
82	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	ns	0.00	0.33	0.00	0.00
83	4	0.00	0.00	0.00	0.27	0.00	0.00	0.00	0.23	0.15	0.19	ns	ns	0.15
84	4	3.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	ns	0.00	ns	ns	0.00
85	4	0.00	0.16	0.47	1.38	11.28	7.37	5.54	6.01	7.61	3.59	ns	4.50	5.65
86	4	0.55	0.50	0.67	1.06	0.23	0.00	0.66	1.20	2.34	2.33	ns	ns	ns
87	4	2.13	2.08	1.98	1.86	0.51	0.17	0.60	1.08	0.70	0.46	ns	ns	1.02
88	4	0.00	0.23	0.16	0.20	0.00	0.00	0.11	0.00	ns	0.24	ns	0.31	0.00
	Mean	**0.87**	**0.42**	**0.47**	**0.68**	**1.72**	**1.08**	**1.15**	**1.54**	**2.70**	**1.32**	**0.33**	**1.60**	**1.14**
89	4	0.14	0.00	0.00	0.16	0.00	0.32	0.00	0.00	ns	0.00	ns	ns	0.22
90	4	0.00	0.00	0.00	0.48	0.29	0.13	0.25	0.44	ns	0.39	0.58	0.45	0.36
91	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.22	0.00	0.00
92	4	ns	ns	0.28	0.46	0.44	0.47	0.59	0.69	ns	2.30	ns	ns	ns
93	4	1.34	1.43	1.27	2.48	1.49	0.00	1.04	1.91	3.18	1.91	2.10	2.53	3.43
94	4	ns	ns	0.00	0.00	0.00	0.00	0.00	ns	0.00	0.00	0.14	0.00	0.00
95	4	1.03	0.32	0.22	0.25	0.00	0.00	0.00	0.00	ns	0.11	0.68	ns	ns
96	4	0.41	0.26	0.20	0.45	0.25	1.29	1.42	1.24	1.16	1.02	1.17	0.95	0.96
	Mean	**0.49**	**0.34**	**0.25**	**0.53**	**0.31**	**0.28**	**0.41**	**0.61**	**1.09**	**0.72**	**0.82**	**0.79**	**0.83**
	Overall mean	**0.52**	**0.35**	**0.31**	**0.52**	**0.73**	**0.50**	**0.58**	**0.74**	**1.31**	**0.80**	**0.63**	**1.01**	**0.84**
Effective Rainfall (mm/wk)		57.99	21.98	13.38	15.06	98.73	17.60	5.02	0.00	47.77	36.75	0.66	1.12	40.11

Appendix 9...continued: Effect of treatment (Dirty water = 1; 2-Cut = 2; Grazed = 3; 1-Cut = 4) on NO_3-N concentrations (mg/l) for each cup and all treatments in the drainage year October 2002 to July 2003; Effective rainfall (mm/week) (Concentrations in red > MAC; ns = no sample).

Cup.	Treatment	29/01/03	05/02/03	12/02/03	19/02/03	26/02/03	05/03/03	12/03/03	19/03/03	26/03/03	02/04/03	09/04/03	16/04/03
73	4	0.51	0.26	0.55	0.50	0.00	0.10	0.10	ns	0.00	0.34	0.19	0.17
74	4	0.00	0.00	0.00	ns	ns	ns	ns	ns	ns	ns	ns	ns
75	4	ns	3.53	ns	ns	4.10	ns	3.50	ns	ns	ns	5.29	5.12
76	4	ns	ns	0.00	ns	ns	ns	ns	ns	ns	ns	ns	ns
77	4	0.00	0.00	0.00	0.00	0.00	ns	ns	ns	ns	ns	ns	ns
78	4	ns	0.00	0.00	0.00	ns	0.00	0.00	ns	ns	ns	0.16	0.00
79	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	ns	ns	0.58	0.44	0.23
80	4	0.23	0.00	0.30	ns	ns	ns	ns	ns	ns	ns	ns	ns
	Mean	**0.15**	**0.54**	**0.12**	**0.13**	**1.10**	**0.03**	**0.90**	**ns**	**0.00**	**0.46**	**1.52**	**1.38**
81	4	ns	ns	ns	ns	ns	ns	ns	ns	0.90	ns	ns	ns
82	4	0.00	0.00	0.00	0.00	ns	0.00	ns	ns	0.10	ns	0.93	0.41
83	4	0.00	0.00	0.00	ns	ns	0.00	0.00	ns	ns	ns	ns	ns
84	4	ns	0.00	0.00	ns	ns	ns	0.00	ns	ns	ns	ns	ns
85	4	5.59	5.34	4.14	ns	ns	0.80	0.60	ns	ns	ns	ns	ns
86	4	0.00	2.57	1.87	ns	ns	ns	ns	ns	ns	ns	ns	ns
87	4	0.77	1.04	1.22	ns	ns	1.4.0	ns	ns	ns	ns	ns	ns
88	4	ns	0.00	0.00	0.00	ns	ns	0.00	ns	0.00	0.25	ns	ns
	Mean	**1.27**	**1.28**	**1.03**	**0.00**	**ns**	**0.55**	**0.15**	**ns**	**0.33**	**0.25**	**0.93**	**0.41**
89	4	0.00	0.00	0.00	0.00	ns	0.00	0.00	ns	ns	ns	ns	ns
90	4	0.00	0.00	0.00	0.00	0.10	0.00	0.00	ns	ns	ns	0.44	ns
91	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	ns	0.00	0.20	0.00	0.00
92	4	ns	ns	ns	ns	ns	ns	1.00	ns	ns	ns	ns	ns
93	4	1.76	3.31	3.99	6.60	ns	8.20	6.10	3.10	0.13	5.25	7.06	7.81
94	4	0.00	0.00	0.00	0.00	0.00	ns	0.00	0.00	0.00	ns	0	0.13
95	4	ns	ns	0.00	0.00	0.00	0.00	0.00	ns	ns	ns	ns	ns
96	4	0.86	0.61	0.54	0.40	ns	0.30	0.10	0.60	ns	ns	ns	ns
	Mean	**0.44**	**0.65**	**0.65**	**1.00**	**0.03**	**1.42**	**0.90**	**1.23**	**0.04**	**2.73**	**1.88**	**2.65**
	Overall mean	**0.62**	**0.82**	**0.60**	**0.38**	**0.56**	**0.67**	**0.65**	**1.23**	**0.13**	**1.15**	**1.44**	**1.48**
Effective Rainfall (mm/wk)		5.06	11.85	17.18	0.00	5.62	29.25	29.78	0.00	0.00	0.00	0.00	0.00

Appendix 9...continued: Effect of treatment (Dirty water = 1; 2-Cut = 2; Grazed = 3; 1-Cut = 4) on NO_3-N concentrations (mg/l) for each cup and all treatments in the drainage year October 2002 to July 2003; Effective rainfall (mm/week) (Concentrations in red > MAC; ns = no sample).

Cup.	Treatment	23/04/03	30/04/03	07/05/03	14/05/03	21/05/03	28/05/03	04/06/03	11/06/03	18/06/03	25/06/03	02/07/03	09/07/03
73	4	0.00	0.00	0.00	0.00	0.00	ns	0.31	0.20	0.00	0.00	0.00	0.00
74	4	ns	ns	ns	ns	ns	ns	ns	ns	0.00	ns	1.50	1.02
75	4	4.57	5.22	5.68	4.97	5.00	ns	ns	5.91	4.15	4.14	4.27	4.36
76	4	0.20	0.20	0.12	0.15	0.00	ns	0.25	ns	ns	ns	ns	ns
77	4	ns	ns	0.17	ns	0.00	0.12	0.16	ns	0.00	0.00	0.00	0.00
78	4	0.00	0.00	0.00	0.00	0.00	ns	0.19	0.15	0.00	0.00	0.00	0.00
79	4	0.00	0.00	0.35	0.00	0.00	ns	0.52	0.66	0.60	0.80	0.30	0.00
80	4	ns	ns	0.42	0.39	0.78	ns	ns	ns	0.51	0.71	1.32	1.38
	Mean	**0.95**	**1.08**	**0.96**	**0.92**	**0.83**	**0.12**	**0.29**	**1.73**	**0.75**	**0.94**	**1.06**	**0.97**
81	4	ns	ns	ns	ns	1.10	ns	ns	ns	ns	ns	ns	ns
82	4	0.11	0.00	0.00	0.00	ns	ns	ns	0.59	0.00	0.00	0.00	0.00
83	4	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
84	4	ns	ns	0.00	ns	0.12	0.63	0.87	0.84	0.58	0.73	ns	1.12
85	4	ns	ns	ns	ns	ns	ns	ns	1.59	9.24	ns	ns	ns
86	4	ns	ns	ns	0.90	0.71	ns	ns	2.90	1.26	ns	ns	ns
87	4	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
88	4	0.00	ns	0.00	ns	ns	ns	ns	ns	0.00	0.00	0.00	0.90
	Mean	**0.06**	**0.00**	**0.00**	**0.45**	**0.64**	**0.63**	**0.87**	**1.48**	**2.22**	**0.24**	**0.00**	**0.67**
89	4	ns	ns	ns	ns	0.22	ns	1.06	0.64	0.50	0.52	ns	ns
90	4	0.46	0.31	0.37	0.43	0.35	ns	1.09	1.34	0.91	0.71	0.24	0.22
91	4	0.00	0.00	0.00	ns	0	ns	0.12	0.17	0.00	0.00	ns	0.00
92	4	ns	1.93	1.24	ns	ns	2.57	ns	ns	ns	ns	ns	ns
93	4	8.02	6.15	3.86	2.61	ns	ns	5.29	ns	3.31	21.39	43.37	44.13
94	4	0.00	0.00	0.00	0.15	0.00	0.40	0.27	0.29	ns	ns	0.00	0.10
95	4	ns	ns	0.00	0.00	0.00	0.00	0.16	0.33	0.00	0.00	0.00	ns
96	4	ns	ns	1.38	0.34	0.58	0.49	0.52	0.58	0.34	0.27	0.11	0.00
	Mean	**2.12**	**1.68**	**0.98**	**0.71**	**0.19**	**0.87**	**1.22**	**0.56**	**0.84**	**3.82**	**8.74**	**8.89**
	Overall mean	**1.04**	**0.92**	**0.65**	**0.69**	**0.55**	**0.54**	**0.79**	**1.26**	**1.27**	**1.67**	**3.27**	**3.51**
Effective Rainfall (mm/wk)		0.00	17.97	36.55	0.00	0.00	0.00	0.00	29.42	0.00	0.00	0.00	0.00

Appendix 10: Effect of treatment (Dirty water = 1; 2-Cut = 2; Grazed = 3; 1-Cut = 4) on NH_4-N concentrations (mg/l) for each cup and all treatments in the drainage year October 2002 to July 2003; Effective rainfall (mm/week) (Concentrations in red > MAC; ns = no sample).

Cup.	Treatment	30/10/02	06/11/02	13/11/02	20/11/02	27/11/02	04/12/02	11/12/02	18/12/02	24/12/02	02/01/03	09/01/03	15/01/03	22/01/03
1	1	ns	ns	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.00	0.00
2	1	2.67	0.00	0.00	0.00	0.00	0.18	0.11	0.23	0.35	0.28	0.42	0.22	0.13
3	1	ns	2.84	0.71	0.66	0.47	0.84	0.54	0.56	ns	1.17	ns	ns	ns
4	1	6.41	0.45	0.13	0.16	0.00	0.26	0.20	0.16	1.42	0.43	0.76	ns	0.44
5	1	1.37	ns	ns	ns	ns	0.00	0.00	0.00	ns	0.11	0.26	ns	0.00
6	1	ns	ns	1.53	ns	0.46	ns	0.28	ns	ns	0.00	ns	ns	ns
7	1	ns	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.00	0.13	0.00	0.00
8	1	1.78	0.13	0.17	0.41	0.20	0.37	0.33	ns	ns	0.41	ns	ns	0.55
	Mean	**3.06**	**0.68**	**0.36**	**0.20**	**0.16**	**0.24**	**0.18**	**0.16**	**0.47**	**0.30**	**0.34**	**0.07**	**0.19**
9	1	ns	1.92	0.58	0.63	0.23	0.50	0.48	0.47	0.00	0.31	0.54	0.28	ns
10	1	ns	0.22	0.00	0.00	0.00	0.16	0.15	0.10	0.14	0.13	0.27	0.00	0.00
11	1	0.15	0.00	0.00	0.00	0.00	0.00	0.20	0.16	0.34	0.00	0.22	0.00	0.00
12	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	ns	0.00	0.15	0.00	0.00
13	1	0.95	0.00	0.00	0.00	0.00	0.13	0.00	0.00	0.00	0.00	0.17	0.00	0.00
14	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.88	ns	0.00	0.13	ns	0.00
15	1	ns	0.34	0.18	0.19	0.24	0.66	0.43	0.61	0.58	0.36	ns	ns	ns
16	1	1.33	0.00	0.13	0.00	0.00	0.26	0.12	0.14	0.19	0.28	ns	0.29	ns
	Mean	**0.49**	**0.31**	**0.11**	**0.10**	**0.06**	**0.21**	**0.17**	**0.30**	**0.28**	**0.14**	**0.25**	**0.10**	**0.00**
17	1	0.40	0.00	0.17	0.00	0.00	0.00	0.18	ns	0.62	0.00	0.18	0.14	0.00
18	1	0.18	0.00	0.00	0.18	0.00	0.24	0.00	0.12	ns	0.21	ns	ns	0.00
19	1	ns	ns	0.30	0.24	0.20	0.31	0.18	0.16	0.29	0.32	ns	ns	0.00
20	1	0.17	0.00	0.00	0.11	0.00	0.41	0.22	0.22	0.45	0.41	ns	ns	0.73
21	1	0.00	0.00	0.00	0.00	0.00	0.11	0.00	0.00	ns	0.00	ns	0.24	0.00
22	1	0.13	0.00	0.16	0.00	0.00	0.21	0.27	0.16	ns	0.17	0.17	0.00	0.00
23	1	ns	ns	1.56	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
24	1	0.60	0.00	0.00	0.22	0.10	0.45	0.29	0.40	0.59	0.45	0.40	0.15	0.10
	Mean	**0.25**	**0.00**	**0.27**	**0.11**	**0.04**	**0.25**	**0.16**	**0.18**	**0.49**	**0.22**	**0.25**	**0.13**	**0.12**
	Overall mean	**1.26**	**0.33**	**0.25**	**0.14**	**0.09**	**0.23**	**0.17**	**0.21**	**0.41**	**0.22**	**0.28**	**0.10**	**0.10**
Effective Rainfall (mm/wk)		57.99	21.98	13.38	15.06	98.73	17.60	5.02	0.00	47.77	36.75	0.66	1.12	40.11

Appendix 10...continued: Effect of treatment (Dirty water = 1; 2-Cut = 2; Grazed = 3; 1-Cut = 4) on NH_4-N concentrations (mg/l) for each cup and all treatments in the drainage year October 2002 to July 2003; Effective rainfall (mm/week) (Concentrations in red > MAC; ns = no sample).

Cup.	Treatment	29/01/03	05/02/03	12/02/03	19/02/03	26/02/03	05/03/03	12/03/03	19/03/03	26/03/03	02/04/03	09/04/03	16/04/03
1	1	0.00	0.00	0.00	ns	0.01	0.00	0.00	ns	ns	ns	ns	ns
2	1	0.31	0.31	0.24	0.06	0.20	0.10	0.10	0.64	1.22	0.00	1.19	0.49
3	1	1.09	0.55	0.37	0.25	0.23	0.30	ns	ns	ns	ns	ns	ns
4	1	ns	ns	0.39	0.00	0.00	0.22	ns	ns	ns	ns	ns	ns
5	1	0.00	0.00	0.00	0.00	0.00	ns	ns	ns	ns	0.37	0.13	0.00
6	1	0.00	0.00	0.00	ns	ns	ns	ns	ns	ns	ns	ns	ns
7	1	ns	0.00	0.00	ns	ns	0.00	0.05	ns	ns	ns	ns	ns
8	1	0.26	ns	0.37	0.12	ns	ns	ns	ns	ns	ns	ns	ns
	Mean	**0.28**	**0.14**	**0.17**	**0.09**	**0.09**	**0.12**	**0.05**	**0.64**	**1.22**	**0.19**	**0.66**	**0.25**
9	1	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
10	1	0.16	0.20	0.23	0.01	0.10	0.20	ns	ns	ns	ns	ns	ns
11	1	0.00	0.00	0.00	0.00	0.02	0.12	ns	ns	ns	ns	ns	ns
12	1	ns	ns	0.00	ns	ns	ns	ns	ns	ns	ns	ns	ns
13	1	0.00	0.10	0.00	0.00	0.00	0.00	0.04	ns	ns	0.70	0.36	0.18
14	1	ns	ns	0.00	ns	ns	ns	0.94	ns	ns	ns	ns	ns
15	1	ns	ns	0.35	0.00	0.04	0.51	0.38	ns	ns	ns	ns	ns
16	1	ns	ns	0.18	0.00	0.00	0.02	ns	ns	ns	ns	ns	ns
	Mean	**0.05**	**0.10**	**0.11**	**0.00**	**0.03**	**0.17**	**0.45**	**ns**	**ns**	**0.70**	**0.36**	**0.18**
17	1	0.18	0.26	0.34	0.01	ns	ns	ns	ns	ns	ns	ns	0.58
18	1	0.19	0.10	0.12	ns	ns	ns	ns	ns	ns	ns	ns	ns
19	1	ns	ns	0.18	ns	ns	ns	ns	ns	ns	ns	ns	ns
20	1	ns	0.18	0.17	ns	ns	ns	ns	ns	ns	ns	ns	ns
21	1	0.23	0.15	0.10	ns	ns	0.23	ns	ns	ns	ns	ns	ns
22	1	0.12	0.00	0.10	0.01	0.00	0.00	ns	ns	ns	ns	ns	ns
23	1	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
24	1	0.25	0.23	0.28	0.21	0.50	0.18	ns	ns	ns	ns	ns	ns
	Mean	**0.19**	**0.15**	**0.18**	**0.08**	**0.25**	**0.14**	**0.25**	**ns**	**ns**	**ns**	**ns**	**0.58**
	Overall mean	**0.17**	**0.13**	**0.15**	**0.05**	**0.12**	**0.14**	**0.25**	**0.64**	**1.22**	**0.44**	**0.51**	**0.34**
Effective Rainfall (mm/wk)		5.06	11.85	17.18	0.00	5.62	29.25	29.78	0.00	0.00	0.00	0.00	0.00

Appendix 10...continued: Effect of treatment (Dirty water = 1; 2-Cut = 2; Grazed = 3; 1-Cut = 4) on NH_4-N concentrations (mg/l) for each cup and all treatments in the drainage year October 2002 to July 2003; Effective rainfall (mm/week) (Concentrations in red > MAC; ns = no sample).

Cup.	Treatment	23/04/03	30/04/03	07/05/03	14/05/03	21/05/03	28/05/03	04/06/03	11/06/03	18/06/03	25/06/03	02/07/03	09/07/03
1	1	ns	0.00	ns	0.14	0.00	ns	ns	ns	ns	ns	ns	ns
2	1	0.57	0.51	0.36	0.69	0.24	0.37	0.38	0.18	0.17	0.45	0.70	0.43
3	1	ns	ns	ns	ns	ns	1.00	0.19	0.00	0.00	0.17	ns	ns
4	1	ns	ns	ns	ns	ns	0.55	0.13	0.00	0.07	0.18	ns	ns
5	1	0.00	0.00	0.00	ns	ns	0.34	0.16	0.00	0.00	0.18	0.29	0.15
6	1	ns	ns	1.20	0.37	0.25	0.31	ns	0.65	0.89	ns	ns	ns
7	1	ns	ns	0.16	ns	0.00	0.00	0.27	0.00	0.00	0.00	0.00	0.20
8	1	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
	Mean	**0.29**	**0.17**	**0.43**	**0.40**	**0.12**	**0.43**	**0.23**	**0.14**	**0.19**	**0.20**	**0.33**	**0.26**
9	1	ns	ns	2.32	0.17	0.00	0.00	0.22	0.00	0.17	0.64	ns	ns
10	1	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
11	1	ns	ns	0.84	0.25	0.15	0.12	0.16	0.12	0.11	ns	0.24	ns
12	1	ns	ns	0.00	0.00	0.00	ns	ns	ns	ns	ns	ns	ns
13	1	0.24	0.27	0.29	0.25	0.19	0.28	0.28	0.27	0.26	0.46	ns	0.91
14	1	ns	ns	0.58	ns	ns	ns	ns	ns	0.00	ns	0.00	ns
15	1	ns	ns	ns	ns	ns	ns	ns	0.57	0.15	0.00	0.21	0.28
16	1	ns	ns	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.00	0.00
	Mean	**0.24**	**0.27**	**0.67**	**0.13**	**0.07**	**0.10**	**0.17**	**0.19**	**0.12**	**0.30**	**0.11**	**0.40**
17	1	0.30	0.29	0.00	0.00	0.00	0.00	0.22	0.00	0.00	ns	ns	ns
18	1	ns	ns	0.00	0.00	0.00	0.00	0.00	0.00	0.00	ns	ns	ns
19	1	ns	ns	0.25	0.00	0.00	0.00	0.00	0.00	0.00	ns	0.19	ns
20	1	ns	ns	0.11	0.15	0.00	0.00	0.00	0.00	0.00	0.16	ns	0.00
21	1	ns	ns	0.52	0.00	0.00	0.00	0.00	0.00	0.00	ns	0.13	0.00
22	1	ns	ns	ns	ns	ns	0.21	0.00	0.00	0.00	ns	0.23	0.00
23	1	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
24	1	ns	ns	0.16	0.00	0.00	0.00	0.14	0.00	0.12	0.26	0.28	0.16
	Mean	**0.30**	**0.29**	**0.17**	**0.03**	**0.00**	**0.03**	**0.05**	**0.00**	**0.02**	**0.21**	**0.21**	**0.04**
	Overall mean	**0.28**	**0.24**	**0.43**	**0.19**	**0.06**	**0.19**	**0.15**	**0.11**	**0.11**	**0.24**	**0.22**	**0.23**
Effective Rainfall (mm/wk)		0.00	17.97	36.55	0.00	0.00	0.00	0.00	29.42	0.00	0.00	0.00	0.00

Appendix 10...continued: Effect of treatment (Dirty water = 1; 2-Cut = 2; Grazed = 3; 1-Cut = 4) on NH_4-N concentrations (mg/l) for each cup and all treatments in the drainage year October 2002 to July 2003; Effective rainfall (mm/week) (Concentrations in red > MAC; ns = no sample).

Cup	Treatment	30/10/02	06/11/02	13/11/02	20/11/02	27/11/02	04/12/02	11/12/02	18/12/02	24/12/02	02/01/03	09/01/03	15/01/03	22/01/03
25	2	0.00	0.00	0.00	0.00	0.00	0.36	0.20	ns	ns	0.55	ns	ns	ns
26	2	0.00	0.00	0.15	0.45	0.00	0.41	0.27	0.36	0.48	0.18	ns	0.75	0.00
27	2	1.32	0.00	0.00	0.00	0.00	0.00	0.12	0.00	0.18	0.00	0.00	ns	0.18
28	2	ns	17.37	0.49	0.25	0.00	0.17	0.13	0.20	1.79	0.00	1.34	0.78	0.00
29	2	0.54	ns	0.20	0.27	0.00	0.68	0.00	0.00	0.62	0.00	0.00	0.00	0.00
30	2	0.00	0.00	0.00	0.00	0.00	ns	0.00	ns	ns	0.00	0.00	ns	ns
31	2	0.68	0.00	0.00	0.15	0.00	0.11	0.00	0.00	ns	0.20	ns	ns	ns
32	2	0.71	0.00	0.26	0.00	0.12	ns	0.32	0.13	ns	0.27	ns	ns	ns
	Mean	**0.46**	**2.48**	**0.14**	**0.14**	**0.02**	**0.29**	**0.13**	**0.12**	**0.77**	**0.15**	**0.34**	**0.51**	**0.05**
33	2	ns	ns	ns	ns	1.32	0.00	0.00	ns	ns	0.00	ns	0.00	0.00
34	2	ns	ns	ns	0.28	0.00	0.00	0.46	0.20	ns	0.23	ns	0.20	0.00
35	2	1.95	0.40	0.54	1.11	0.50	0.90	0.45	0.55	ns	0.00	1.78	0.78	0.60
36	2	4.70	0.66	0.47	1.09	0.52	1.70	0.53	0.55	ns	0.00	ns	ns	1.20
37	2	0.61	0.00	0.38	0.24	0.15	0.24	0.27	0.20	0.34	0.00	0.34	0.20	0.00
38	2	0.70	0.00	0.15	0.59	0.11	0.82	0.28	0.30	ns	0.00	ns	ns	2.28
39	2	ns	0.10	0.96	0.00	0.00	0.00	0.30	0.10	0.69	0.00	0.40	0.12	0.00
40	2	ns	9.92	ns	3.50	0.51	3.28	0.53	0.64	ns	ns	ns	ns	ns
	Mean	**1.99**	**1.85**	**0.50**	**0.97**	**0.39**	**0.87**	**0.35**	**0.36**	**0.52**	**0.03**	**0.84**	**0.26**	**0.58**
41	2	1.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.32	0.00	1.31	0.00	0.00
42	2	ns	0.00	0.00	0.19	0.00	ns	0.00	ns	ns	0.32	0.00	ns	ns
43	2	ns	1.37	0.00	0.28	0.00	0.00	0.32	0.11	ns	0.15	ns	ns	0.00
44	2	0.00	0.00	0.00	ns	0.00	0.00	0.00	0.00	ns	0.00	ns	ns	0.00
45	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.00	0.00
46	2	0.12	0.00	0.00	0.28	0.20	0.49	0.21	0.37	0.58	0.00	ns	ns	ns
47	2	0.15	0.00	ns	0.00	0.00	0.00	0.00	0.00	0.00	0.00	ns	ns	ns
48	2	0.87	0.00	0.00	0.35	1.13	0.20	0.17	0.21	0.47	0.27	ns	ns	0.63
	Mean	**0.39**	**0.17**	**0.00**	**0.16**	**0.17**	**0.10**	**0.09**	**0.10**	**0.27**	**0.09**	**0.48**	**0.00**	**0.13**
	Overall mean	**0.95**	**1.50**	**0.21**	**0.42**	**0.19**	**0.42**	**0.19**	**0.19**	**0.52**	**0.09**	**0.55**	**0.26**	**0.25**
Effective Rainfall (mm/wk)		57.99	21.98	13.38	15.06	98.73	17.60	5.02	0.00	47.77	36.75	0.66	1.12	40.11

Appendix 10...continued: Effect of treatment (Dirty water = 1; 2-Cut = 2; Grazed = 3; 1-Cut = 4) on NH_4-N concentrations (mg/l) for each cup and all treatments in the drainage year October 2002 to July 2003; Effective rainfall (mm/week) (Concentrations in red > MAC; ns = no sample).

Cup.	Treatment	29/01/03	05/02/03	12/02/03	19/02/03	26/02/03	05/03/03	12/03/03	19/03/03	26/03/03	02/04/03	09/04/03	16/04/03
25	2	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
26	2	0.00	0.21	0.00	0.02	ns	0.27	0.48	ns	ns	ns	ns	ns
27	2	0.00	0.00	0.00	0.00	ns	0.58	0.00	0.03	1.27	ns	1.47	0.00
28	2	0.13	0.29	0.18	ns	0.34	0.82	0.87	ns	ns	ns	ns	ns
29	2	0.10	0.00	0.00	0.00	ns	0.51	0.00	ns	ns	ns	ns	ns
30	2	ns	ns	0.00	ns	ns	ns	ns	ns	ns	ns	ns	ns
31	2	ns	ns	0.18	0.00	0.00	ns	ns	ns	ns	ns	ns	ns
32	2	ns	0.28	0.10	0.00	0.00	0.02	ns	ns	ns	ns	ns	ns
	Mean	**0.06**	**0.16**	**0.07**	**0.00**	**0.11**	**0.44**	**0.34**	**0.03**	**1.27**	**ns**	**1.47**	**0.00**
33	2	0.00	0.10	0.00	0.00	0.05	0.02	0.00	ns	ns	ns	ns	ns
34	2	0.00	0.15	0.13	0.04	0.10	0.31	ns	ns	ns	ns	ns	0.29
35	2	0.70	0.70	0.66	0.53	0.50	1.02	1.66	ns	ns	1.49	ns	1.02
36	2	0.51	0.37	0.37	0.12	0.60	ns	ns	ns	ns	ns	ns	ns
37	2	0.18	0.11	0.00	0.00	0.00	0.08	0.06	ns	ns	ns	ns	0
38	2	0.27	0.32	0.28	0.11	0.18	0.33	0.32	ns	ns	ns	ns	0.77
39	2	0.26	0.32	0.29	0.20	0.28	0.74	ns	ns	ns	ns	ns	ns
40	2	ns	ns	ns	0.00	ns	4.00	ns	ns	ns	ns	ns	ns
	Mean	**0.27**	**0.30**	**0.25**	**0.13**	**0.24**	**0.93**	**0.51**	**ns**	**ns**	**1.49**	**ns**	**0.52**
41	2	0.00	0.00	0.00	ns	0.00	ns	ns	ns	ns	ns	ns	ns
42	2	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
43	2	ns	1.25	0.00	0.00	0.03	1.83	ns	ns	ns	0.71	ns	ns
44	2	0.00	0.00	0.00	0.00	ns	ns	0.50	ns	ns	ns	ns	ns
45	2	0.00	0.00	0.00	0.00	0.00	0.08	0.07	0.07	0.26	0.29	0.17	0.77
46	2	ns	ns	ns	ns	ns	0.66	0.20	ns	1.84	0.67	ns	ns
47	2	ns	ns	ns	ns	ns	ns	1.46	0.00	0.07	0.10	0.00	0.00
48	2	0.29	ns	0.55	ns	ns	ns	ns	ns	ns	ns	ns	ns
	Mean	**0.07**	**0.31**	**0.11**	**0.00**	**0.01**	**0.86**	**0.56**	**0.04**	**0.72**	**0.44**	**0.09**	**0.39**
	Overall mean	**0.13**	**0.25**	**0.14**	**0.04**	**0.12**	**0.74**	**0.47**	**0.03**	**1.00**	**0.97**	**0.78**	**0.30**
Effective Rainfall (mm/wk)		5.06	11.85	17.18	0.00	5.62	29.25	29.78	0.00	0.00	0.00	0.00	0.00

Appendix 10...continued: Effect of treatment (Dirty water = 1; 2-Cut = 2; Grazed = 3; 1-Cut = 4) on NH_4-N concentrations (mg/l) for each cup and all treatments in the drainage year October 2002 to July 2003; Effective rainfall (mm/week) (Concentrations in red > MAC; ns = no sample).

Cup.	Treatment	23/04/03	30/04/03	07/05/03	14/05/03	21/05/03	28/05/03	04/06/03	11/06/03	18/06/03	25/06/03	02/07/03	09/07/03
25	2	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
26	2	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
27	2	0.00	0.17	0.28	0.84	ns	ns	1.15	0.42	0.40	0.75	5.10	ns
28	2	ns	ns	1.58	ns	ns	ns	ns	ns	ns	ns	ns	ns
29	2	ns	ns	0.25	0.40	0.38	0.36	ns	ns	ns	ns	0.00	0.00
30	2	ns	ns	0.23	ns	ns	ns	ns	0.00	ns	ns	0.00	ns
31	2	ns	ns	0.34	ns	0.23	0.24	0.48	0.38	ns	ns	ns	ns
32	2	ns	ns	1.65	ns	ns	ns	ns	ns	ns	ns	ns	ns
	Mean	**0.00**	**0.17**	**0.72**	**0.62**	**0.31**	**0.30**	**0.82**	**0.27**	**0.40**	**0.75**	**1.70**	**0.00**
33	2	ns	0.25	ns	ns	0.19	0.00	ns	0.31	ns	ns	ns	ns
34	2	0.69	0.64	ns	ns	0.28	2.94	ns	ns	ns	ns	ns	2.10
35	2	0.65	0	1.18	1.49	0.43	0.62	0.62	0.34	0.41	0.49	1.11	0.42
36	2	ns	0.58	0.15	ns	0.00	0.00	0.17	0.23	0.30	0.33	ns	0.28
37	2	0.00	0.66	0.00	0.00	0.00	0.00	0.24	0.00	0.11	0.00	0.14	0.00
38	2	0.24	0	ns	ns	0.12	0.14	0.14	0.15	0.19	0.26	ns	ns
39	2	ns	ns	ns	ns	3.55	ns	ns	ns	ns	ns	ns	ns
40	2	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
	Mean	**0.40**	**0.36**	**0.44**	**0.75**	**0.65**	**0.62**	**0.29**	**0.21**	**0.25**	**0.27**	**0.63**	**0.70**
41	2	ns	0.35	0.13	1.12	0.26	0.35	0.65	0.26	0.29	0.35	0.14	0.14
42	2	ns	ns	2.30	ns	ns	ns	ns	ns	0.26	ns	ns	ns
43	2	0.21	0.14	0.00	0.50	ns	ns	ns	0.25	ns	ns	ns	ns
44	2	ns	ns	0.46	ns	ns	0.41	0.31	0.13	0.12	ns	ns	ns
45	2	0.00	0.00	0.00	0.00	0.00	0.31	0.12	0.00	0.77	0.17	0.00	0.00
46	2	ns	ns	0.52	ns	ns	ns	ns	1.04	0.36	0.36	0.17	0.15
47	2	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.00	0.11	0.10	0.00	0.10
48	2	ns	ns	1.47	0.27	0.00	0.23	0.24	ns	ns	ns	ns	ns
	Mean	**0.07**	**0.12**	**0.61**	**0.38**	**0.07**	**0.26**	**0.29**	**0.28**	**0.32**	**0.25**	**0.08**	**0.10**
	Overall mean	**0.16**	**0.22**	**0.59**	**0.58**	**0.34**	**0.39**	**0.46**	**0.25**	**0.32**	**0.42**	**0.80**	**0.27**
Effective Rainfall (mm/wk)		0.00	17.97	36.55	0.00	0.00	0.00	0.00	29.42	0.00	0.00	0.00	0.00

Appendix 10...continued: Effect of treatment (Dirty water = 1; 2-Cut = 2; Grazed = 3; 1-Cut = 4) on NH_4-N concentrations (mg/l) for each cup and all treatments in the drainage year October 2002 to July 2003; Effective rainfall (mm/week) (Concentrations in red > MAC; ns = no sample).

Cup.	Treatment	30/10/02	06/11/02	13/11/02	20/11/02	27/11/02	04/12/02	11/12/02	18/12/02	24/12/02	02/01/03	09/01/03	15/01/03	22/01/03
49	3	0.54	0.00	0.34	0.21	0.00	0.13	0.16	ns	ns	0.00	ns	ns	ns
50	3	1.33	0.00	0.27	0.37	0.00	0.24	0.12	0.00	ns	0.12	ns	0.13	0.00
51	3	0.33	0.00	0.12	0.11	0.00	0.21	0.15	0.16	0.46	0.22	0.29	0.00	0.00
52	3	0.71	0.00	0.00	0.10	0.00	0.00	0.19	0.00	ns	0.00	ns	ns	ns
53	3	0.17	0.00	0.00	ns	0.00	ns	0.27	0.00	0.95	0.11	0.11	ns	ns
54	3	0.74	0.00	0.18	0.21	0.14	0.27	0.14	ns	ns	0.30	ns	ns	0.23
55	3	ns	ns	ns	ns	ns	ns	ns	ns	ns	0.00	ns	ns	ns
56	3	0.31	0.00	5.00	0.16	0.00	0.00	0.21	0.00	0.15	0.00	0.00	0.00	0.00
	Mean	**0.59**	**0.00**	**0.84**	**0.19**	**0.02**	**0.14**	**0.18**	**0.03**	**0.52**	**0.09**	**0.13**	**0.04**	**0.06**
57	3	0.22	0.00	0.38	0.19	0.14	ns	0.00	0.10	ns	0.21	ns	ns	0.00
58	3	ns	ns	ns	ns	ns	ns	ns	ns	ns	0.00	0.15	ns	ns
59	3	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
60	3	0.50	ns	0.00	0.00	0.00	0.00	0.00	0.00	ns	0.00	ns	ns	0.12
61	3	0.50	0.00	0.19	0.00	0.00	0.15	0.00	0.00	ns	0.00	ns	ns	0.00
62	3	0.94	0.00	0.00	0.00	0.00	0.00	0.11	0.00	0.24	0.00	0.00	0.00	0.00
63	3	0.12	ns	0.00	0.00	0.00	0.00	0.13	0.00	ns	0.00	ns	ns	ns
64	3	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
	Mean	**0.46**	**0.00**	**0.11**	**0.04**	**0.03**	**0.04**	**0.05**	**0.02**	**0.24**	**0.04**	**0.08**	**0.00**	**0.03**
65	3	1.01	0.00	0.00	0.00	0.00	0.12	0.00	ns	0.12	0.00	0.22	ns	0.00
66	3	6.70	0.00	0.00	0.13	0.00	0.22	0.11	ns	ns	0.00	ns	ns	0.00
67	3	ns	3.83	ns	ns	0.16	0.00	ns	ns	ns	0.00	0.17	ns	ns
68	3	0.79	0.00	0.26	0.35	0.16	0.31	0.19	0.34	0.35	0.20	0.22	0.00	0.00
69	3	0.34	0.00	0.22	0.00	0.00	0.10	0.00	ns	ns	0.13	ns	0.15	0.00
70	3	7.87	0.00	0.13	0.24	0.00	0.20	0.17	ns	0.00	0.10	ns	ns	ns
71	3	1.06	0.00	0.60	0.39	0.00	0.39	0.28	0.22	0.46	0.31	0.27	0.12	0.00
72	3	0.27	0.00	ns	0.00	0.00	0.20	0.17	0.00	ns	0.16	ns	ns	0.49
	Mean	**2.58**	**0.48**	**0.20**	**0.16**	**0.04**	**0.19**	**0.13**	**0.19**	**0.23**	**0.11**	**0.22**	**0.09**	**0.08**
	Overall mean	**1.21**	**0.16**	**0.39**	**0.13**	**0.03**	**0.12**	**0.12**	**0.08**	**0.33**	**0.08**	**0.14**	**0.04**	**0.06**
Effective Rainfall (mm/wk)		57.99	21.98	13.38	15.06	98.73	17.60	5.02	0.00	47.77	36.75	0.66	1.12	40.11

Appendix 10...continued: Effect of treatment (Dirty water = 1; 2-Cut = 2; Grazed = 3; 1-Cut = 4) on NH_4-N concentrations (mg/l) for each cup and all treatments in the drainage year October 2002 to July 2003; Effective rainfall (mm/week) (Concentrations in red > MAC; ns = no sample).

Cup.	Treatment	29/01/03	05/02/03	12/02/03	19/02/03	26/02/03	05/03/03	12/03/03	19/03/03	26/03/03	02/04/03	09/04/03	16/04/03
49	3	ns	ns	ns	ns	ns	ns	1.15	ns	ns	ns	ns	ns
50	3	0.16	0.20	0.22	0.04	0.06	0.17	0.20	ns	ns	ns	ns	ns
51	3	0.00	ns	0.18	ns	ns	0.13	ns	ns	ns	ns	ns	ns
52	3	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
53	3	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
54	3	0.18	0.36	0.19	ns	ns	ns	ns	ns	ns	ns	ns	ns
55	3	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
56	3	0.00	0.10	0.00	0.00	0.00	0.11	ns	ns	6.60	0.43	0.00	0.00
	Mean	**0.09**	**0.22**	**0.15**	**0.02**	**0.03**	**0.14**	**0.68**	**ns**	**6.60**	**0.43**	**0.00**	**0.00**
57	3	0.00	0.15	ns	ns	0.00	ns	0.41	ns	ns	ns	ns	ns
58	3	ns	1.14	0.21	0.11	0.12	0.01	0.02	0.00	ns	ns	ns	ns
59	3	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
60	3	ns	ns	0.00	0.00	0.00	0.00	ns	ns	ns	ns	ns	ns
61	3	0.00	0.00	0.00	ns	0.00	0.00	0.00	ns	ns	ns	ns	ns
62	3	0.00	0.00	0.00	0.00	ns	0.00	0.00	ns	ns	ns	ns	ns
63	3	ns	ns	0.00	0.00	0	ns	ns	ns	ns	ns	ns	ns
64	3	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
	Mean	**0.00**	**0.32**	**0.04**	**0.03**	**0.02**	**0.00**	**0.11**	**0.00**	**ns**	**0.00**	**0.00**	**0.00**
65	3	0.10	0.00	0.00	ns	ns	0.00	ns	ns	ns	ns	ns	ns
66	3	0.00	0.00	0.14	ns	ns	ns	ns	ns	ns	ns	ns	ns
67	3	0.00	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
68	3	0.00	0.00	0.00	0.00	ns	0.00	0.00	0.00	0.18	0.00	0.00	0.00
69	3	0.00	0.00	0.00	ns	ns	ns	0.00	ns	ns	ns	ns	ns
70	3	ns	0.22	0.00	0.00	0.00	0.00	0.87	ns	ns	ns	ns	ns
71	3	0.15	0.25	0.16	ns	ns	ns	0.05	ns	ns	ns	ns	ns
72	3	ns	0.33	ns	ns	ns	ns	ns	0.00	ns	ns	ns	ns
	Mean	**0.04**	**0.11**	**0.05**	**0.00**	**0.00**	**0.00**	**0.23**	**0.00**	**0.18**	**0.00**	**0.00**	**0.00**
	Overall mean	**0.04**	**0.22**	**0.08**	**0.02**	**0.02**	**0.05**	**0.34**	**0.00**	**3.39**	**0.22**	**0.00**	**0.00**
Effective Rainfall (mm/wk)		5.06	11.85	17.18	0.00	5.62	29.25	29.78	0.00	0.00	0.00	0.00	0.00

Appendix 10...continued: Effect of treatment (Dirty water = 1; 2-Cut = 2; Grazed = 3; 1-Cut = 4) on NH_4-N concentrations (mg/l) for each cup and all treatments in the drainage year October 2002 to July 2003; Effective rainfall (mm/week) (Concentrations in red > MAC; ns = no sample).

Cup.	Treatment	23/04/03	30/04/03	07/05/03	14/05/03	21/05/03	28/05/03	04/06/03	11/06/03	18/06/03	25/06/03	02/07/03	09/07/03
49	3	ns	ns	0.10	ns	0.00	ns	0.36	0.00	0.24	0.00	0.21	0.11
50	3	ns	ns	0.40	0.32	0.00	ns	0.73	0.00	0.11	0.18	0.35	0.26
51	3	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
52	3	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
53	3	ns	ns	ns	ns	ns	ns	ns	0.17	0.00	ns	ns	0.00
54	3	ns	ns	1.12	ns	ns	0.70	ns	0.15	0.13	ns	ns	ns
55	3	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
56	3	0.00	0.00	0.00	0.29	0.00	4.90	0.27	0.00	0.00	0.33	0.00	0.00
	Mean	**0.00**	**0.00**	**0.41**	**0.31**	**0.00**	**2.80**	**0.45**	**0.06**	**0.10**	**0.17**	**0.19**	**0.09**
57	3	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	5.15	ns
58	3	0.40	0.38	0.28	0.30	0.20	0.29	0.34	0.29	0.22	1.12	0.51	0.31
59	3	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
60	3	ns	ns	0.17	ns	0.00	0.00	0.00	0.00	ns	ns	ns	ns
61	3	ns	ns	ns	0.00	0.00	0.00	ns	0.11	0.00	ns	ns	ns
62	3	ns	ns	1.17	ns	ns	ns	ns	0.14	0.00	0.00	0.00	0.00
63	3	ns	ns	1.17	ns	ns	0.11	ns	ns	ns	ns	ns	ns
64	3	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
	Mean	**0.40**	**0.38**	**0.70**	**0.15**	**0.07**	**0.10**	**0.17**	**0.14**	**0.07**	**0.56**	**1.89**	**0.16**
65	3	ns	ns	0.32	0.13	ns	0.49	ns	0.16	0.18	ns	0.91	ns
66	3	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
67	3	ns	ns	ns	ns	ns	0.20	0.19	0.12	0.11	ns	ns	ns
68	3	0.00	0.00	0.00	0.00	0.00	0.00	ns	0.00	0.00	0.00	0.00	0.00
69	3	ns	ns	0.00	ns	ns	ns	0.12	0.00	0.00	0.00	0.00	0.00
70	3	ns	ns	0.00	0.00	ns	0.15	ns	ns	0.54	ns	ns	ns
71	3	ns	0.28	0.17	ns	0.00	0.22	0.18	0.11	0.00	0.10	0.25	0.13
72	3	ns	0.12	0.00	ns	0.00	ns	ns	0.33	0.00	ns	ns	ns
	Mean	**0.00**	**0.13**	**0.08**	**0.04**	**0.00**	**0.21**	**0.16**	**0.12**	**0.12**	**0.03**	**0.29**	**0.04**
	Overall mean	**0.13**	**0.17**	**0.39**	**0.17**	**0.02**	**1.04**	**0.26**	**0.11**	**0.10**	**0.25**	**0.79**	**0.10**
Effective Rainfall (mm/wk)		0.00	17.97	36.55	0.00	0.00	0.00	0.00	29.42	0.00	0.00	0.00	0.00

Appendix 10...continued: Effect of treatment (Dirty water = 1; 2-Cut = 2; Grazed = 3; 1-Cut = 4) on NH_4-N concentrations (mg/l) for each cup and all treatments in the drainage year October 2002 to July 2003; Effective rainfall (mm/week) (Concentrations in red > MAC; ns = no sample).

Cup.	Treatment	30/10/02	06/11/02	13/11/02	20/11/02	27/11/02	04/12/02	11/12/02	18/12/02	24/12/02	02/01/03	09/01/03	15/01/03	22/01/03
73	4	15.71	0.58	0.60	0.34	0.16	0.26	0.16	0.18	0.36	0.00	0.10	0.00	0.21
74	4	0.71	0.00	0.00	0.21	0.00	0.22	0.11	0.00	0.16	0.00	0.00	0.00	0.00
75	4	0.38	0.00	0.00	0.00	0.00	0.13	0.10	ns	ns	0.16	0.46	0.20	0.00
76	4	0.12	0.00	0.00	0.00	0.00	0.00	0.00	ns	ns	0.00	ns	ns	0.00
77	4	0.00	0.00	0.12	0.00	0.00	0.00	0.00	0.14	0.00	0.00	0.00	0.00	0.00
78	4	0.17	0.00	0.00	0.23	0.00	0.00	0.00	ns	0.00	0.26	0.00	ns	0.00
79	4	ns	ns	1.45	0.26	0.00	0.18	0.17	ns	ns	0.00	0.00	0.00	0.00
80	4	0.53	0.00	0.00	0.00	0.00	0.29	0.00	0.00	0.00	0.00	ns	ns	0.00
	Mean	**2.52**	**0.08**	**0.27**	**0.13**	**0.02**	**0.13**	**0.07**	**0.08**	**0.10**	**0.05**	**0.09**	**0.04**	**0.03**
81	4	ns	ns	ns	ns	ns	ns	0.60	0.00	ns	0.00	ns	ns	ns
82	4	0.46	0.00	0.19	0.00	0.00	0.00	0.18	0.00	ns	0.00	0.00	0.00	0.00
83	4	2.06	0.29	0.36	0.39	0.25	0.31	0.15	0.11	0.10	0.00	ns	ns	0.24
84	4	1.37	0.00	1.09	0.00	0.00	0.11	0.00	0.28	ns	0.00	ns	ns	0.00
85	4	0.79	0.00	0.17	0.36	0.00	0.28	0.18	0.18	0.15	0.00	ns	0.15	0.00
86	4	2.94	0.66	0.00	0.36	0.00	0.00	0.00	0.20	1.09	0.00	ns	ns	ns
87	4	1.31	0.00	0.00	0.16	0.00	0.00	0.00	0.15	0.00	0.00	ns	ns	0.00
88	4	10.45	5.76	0.00	0.00	0.00	0.00	0.00	0.15	ns	0.00	ns	0.00	0.00
	Mean	**2.77**	**0.96**	**0.26**	**0.18**	**0.04**	**0.10**	**0.14**	**0.13**	**0.34**	**0.00**	**0.00**	**0.05**	**0.04**
89	4	1.40	0.00	0.00	0.19	0.00	0.00	0.00	0.00	ns	0.00	ns	ns	0.14
90	4	1.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	ns	0.00	0.00	0.00	0.00
91	4	0.27	0.00	0.00	0.00	0.00	0.00	0.13	0.00	0.00	0.00	0.11	0.00	0.00
92	4	ns	ns	0.00	0.00	0.00	0.00	0.00	0.00	ns	0.00	ns	ns	ns
93	4	0.88	0.00	0.00	0.19	0.00	0.00	0.00	0.10	0.38	0.17	0.29	0.13	0.11
94	4	ns	ns	0.00	0.00	0.00	0.00	0.15	ns	0.00	0.00	0.00	0.00	0.00
95	4	0.41	0.00	0.00	0.00	0.00	0.21	0.15	0.23	ns	0.33	0.16	ns	ns
96	4	0.64	0.00	0.00	0.00	0.00	0.14	0.15	0.00	0.10	0.00	0.17	0.17	0.00
	Mean	**0.84**	**0.00**	**0.00**	**0.05**	**0.00**	**0.04**	**0.07**	**0.05**	**0.12**	**0.06**	**0.12**	**0.06**	**0.04**
	Overall mean	**2.04**	**0.35**	**0.18**	**0.12**	**0.02**	**0.09**	**0.09**	**0.09**	**0.19**	**0.04**	**0.07**	**0.05**	**0.04**
Effective Rainfall (mm/wk)		57.99	21.98	13.38	15.06	98.73	17.60	5.02	0.00	47.77	36.75	0.66	1.12	40.11

Appendix 10...continued: Effect of treatment (Dirty water = 1; 2-Cut = 2; Grazed = 3; 1-Cut = 4) on NH_4-N concentrations (mg/l) for each cup and all treatments in the drainage year October 2002 to July 2003; Effective rainfall (mm/week) (Concentrations in red > MAC; ns = no sample).

Cup.	Treatment	29/01/03	05/02/03	12/02/03	19/02/03	26/02/03	05/03/03	12/03/03	19/03/03	26/03/03	02/04/03	09/04/03	16/04/03
73	4	0.00	0.00	0.00	0.00	0.21	0.00	0.10	ns	0.31	0.22	0.15	0.24
74	4	0.00	0.00	0.23	ns	ns	ns	ns	ns	ns	ns	ns	ns
75	4	ns	0.17	ns	ns	0.51	ns	0.03	ns	ns	ns	1.19	0.00
76	4	ns	ns	0.00	ns	ns	ns	ns	ns	ns	ns	ns	ns
77	4	0.00	0.00	0.00	0.00	0.04	ns	ns	ns	ns	ns	ns	ns
78	4	ns	0.00	0.00	0.00	ns	0.04	0.00	ns	ns	ns	0.42	0.13
79	4	0.00	0.00	0.00	0.00	0.06	0.00	0.06	ns	ns	0.14	0.00	0.00
80	4	0.00	0.00	0.00	ns	ns	ns	ns	ns	ns	ns	ns	ns
	Mean	**0.00**	**0.02**	**0.03**	**0.00**	**0.21**	**0.01**	**0.05**	**ns**	**0.31**	**0.18**	**0.44**	**0.09**
81	4	ns	ns	ns	ns	ns	ns	ns	ns	0.00	ns	ns	ns
82	4	0.00	0.00	0.00	0.00	ns	0.00	ns	ns	0.7	ns	5.93	0.25
83	4	0.00	0.00	0.00	ns	ns	0.61	0.10	ns	ns	ns	ns	ns
84	4	ns	0.00	0.00	ns	ns	ns	0.00	ns	ns	ns	ns	ns
85	4	0.00	0.16	0.24	ns	ns	0.02	0.00	ns	ns	ns	ns	ns
86	4	0.37	0.00	0.10	ns	ns	ns	ns	ns	ns	ns	ns	ns
87	4	0.21	0.00	0.00	ns	ns	0.00	ns	ns	ns	ns	ns	ns
88	4	ns	0.00	0.00	0.00	ns	ns	0.00	ns	0.04	0.10	ns	ns
	Mean	**0.12**	**0.02**	**0.05**	**0.00**	**ns**	**0.16**	**0.03**	**0.00**	**0.25**	**0.10**	**5.93**	**0.25**
89	4	0.00	0.00	0.00	0.00	ns	0.00	0.03	ns	ns	ns	ns	ns
90	4	0.00	0.00	0.00	0.00	0.14	0.00	0.00	ns	ns	ns	1.25	ns
91	4	0.00	0.00	0.00	0.00	0.05	0.00	0.00	ns	0.40	0.20	0.10	0.00
92	4	ns	ns	ns	ns	ns	ns	0.31	ns	ns	ns	ns	ns
93	4	0.17	0.34	0.24	0.22	ns	0.27	0.01	0.14	0.43	0.40	0.45	0.16
94	4	0.00	0.00	0.00	0.00	0.00	ns	0.04	0.10	4.50	ns	0.41	0.25
95	4	ns	ns	0.00	0.00	0.10	0.00	0.00	ns	ns	ns	ns	ns
96	4	0.00	0.21	0.00	0.13	ns	0.03	0.33	0.35	ns	ns	ns	ns
	Mean	**0.03**	**0.09**	**0.03**	**0.05**	**0.07**	**0.05**	**0.09**	**0.20**	**1.78**	**0.30**	**0.55**	**0.14**
	Overall mean	**0.05**	**0.05**	**0.04**	**0.02**	**0.14**	**0.07**	**0.05**	**0.20**	**0.78**	**0.19**	**2.31**	**0.16**
Effective Rainfall (mm/wk)		5.06	11.85	17.18	0.00	5.62	29.25	29.78	0.00	0.00	0.00	0.00	0.00

Appendix 10...continued: Effect of treatment (Dirty water = 1; 2-Cut = 2; Grazed = 3; 1-Cut = 4) on NH_4-N concentrations (mg/l) for each cup and all treatments in the drainage year October 2002 to July 2003; Effective rainfall (mm/week) (Concentrations in red > MAC; ns = no sample).

Cup.	Treatment	23/04/03	30/04/03	07/05/03	14/05/03	21/05/03	28/05/03	04/06/03	11/06/03	18/06/03	25/06/03	02/07/03	09/07/03
73	4	0.19	0.15	0.00	0.00	0.00	ns	0.40	0.00	0.00	0.22	0.21	0.14
74	4	ns	ns	ns	ns	ns	ns	ns	ns	0.55	ns	0.00	0.15
75	4	0.11	0.00	0.00	0.00	0.00	ns	ns	0.21	0.00	0.20	0.33	0.39
76	4	0.15	0.00	0.00	0.00	0.00	ns	0.00	ns	ns	ns	ns	ns
77	4	ns	ns	0.24	ns	0.11	0.12	0.00	ns	0.00	0.00	0.00	0.00
78	4	0.14	0.00	0.00	0.00	0.00	ns	0.98	0.15	0.00	0.16	0.18	0.15
79	4	0.00	0.00	0.00	0.00	0.00	ns	0.32	0.00	0.00	0.13	0.08	0.00
80	4	ns	ns	0.00	0.00	0.00	ns	ns	ns	0.17	0.00	0.07	0.00
	Mean	**0.12**	**0.03**	**0.03**	**0.00**	**0.02**	**0.12**	**0.34**	**0.09**	**0.10**	**0.12**	**0.12**	**0.12**
81	4	ns	ns	ns	ns	0.00	ns	ns	ns	ns	ns	ns	ns
82	4	0.22	0.19	0.00	0.00	ns	ns	ns	0.41	0.13	0.20	0.18	0.16
83	4	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
84	4	ns	ns	0.00	ns	0.33	0.27	0.00	0.00	0.00	0.00	ns	0.27
85	4	ns	ns	ns	ns	ns	ns	ns	1.41	0.00	ns	ns	ns
86	4	ns	ns	ns	1.47	0.68	ns	ns	0.81	0.12	ns	ns	ns
87	4	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
88	4	0.00	ns	0.10	ns	ns	ns	ns	ns	0.00	0.00	0.03	0.59
	Mean	**0.11**	**0.19**	**0.03**	**0.74**	**0.34**	**0.27**	**0.00**	**0.66**	**0.05**	**0.07**	**0.11**	**0.34**
89	4	ns	ns	ns	ns	0.18	ns	1.06	0.00	0.00	0.00	ns	ns
90	4	0.46	0.16	0.12	0.00	0.00	ns	0.24	0.00	0.00	0.18	0.22	0.00
91	4	0.00	0.00	0.00	ns	0.00	ns	0.11	0.00	0.00	0.12	ns	0.00
92	4	ns	0.00	0.00	ns	ns	0.00	ns	ns	ns	ns	ns	ns
93	4	0.18	0.15	0.14	0.25	ns	ns	0.64	ns	2.71	0.90	1.34	0.55
94	4	0.25	0.22	0.17	0.12	0.00	0.20	0.27	0.00	ns	ns	1.98	0.59
95	4	ns	ns	0.11	0.00	0.00	0.12	0.16	0.00	0.00	0.00	0.03	ns
96	4	ns	ns	2.91	1.51	0.74	0.33	0.52	0.15	0.30	0.25	0.23	0.00
	Mean	**0.22**	**0.11**	**0.49**	**0.38**	**0.15**	**0.16**	**0.43**	**0.03**	**0.50**	**0.24**	**0.76**	**0.23**
	Overall mean	**0.15**	**0.11**	**0.19**	**0.37**	**0.17**	**0.18**	**0.26**	**0.26**	**0.22**	**0.14**	**0.33**	**0.23**
Effective Rainfall (mm/wk)		0.00	17.97	36.55	0.00	0.00	0.00	0.00	29.42	0.00	0.00	0.00	0.00

Appendix 11 : Effect of treatment (Dirty water = 1; 2-Cut = 2; Grazed = 3; 1-Cut = 4) on NO_3-N concentrations (mg/l) for each cup and all treatments in the drainage year November 2003 to May 2004; Effective rainfall (mm/week) (Concentrations in red > MAC; ns = no sample).

Cup	Treatment	19/11/03	26/11/03	3/12/03	10/12/03	17/12/03	23/12/03	30/12/03	7/1/04	14/1/04	21/1/04	28/1/04	4/2/04	11/2/04
1	1	ns	ns	ns	ns	ns	ns	1.73	ns	1.54	ns	ns	1.60	1.60
2	1	ns	1.30	2.17	2.71	3.17	3.67	4.34	5.37	6.54	8.59	12.16	10.49	11.66
3	1	0.72	1.57	2.34	2.21	2.11	1.96	2.20	ns	ns	3.93	5.86	6.45	9.08
4	1	1.29	2.66	4.20	ns	4.59	4.73	4.53	ns	ns	6.43	22.93	8.90	9.07
5	1	5.32	4.71	4.69	5.28	6.79	9.49	9.29	ns	28.26	22.27	27.28	14.76	9.06
6	1	ns	ns	10.55	ns	ns	ns	ns	ns	24.38	14.91	ns	15.34	14.97
7	1	4.79	7.16	ns	16.06	27.47	40.04	46.49	68.53	95.06	80.56	85.39	58.04	ns
8	1	3.99	3.10	2.48	ns	2.50	2.84	3.30	3.79	4.32	5.62	9.13	ns	12.55
	Mean	**3.22**	**3.42**	**4.41**	**6.57**	**7.77**	**10.46**	**10.27**	**25.90**	**26.68**	**20.33**	**27.13**	**16.51**	**9.71**
9	1	ns	14.18	10.55	ns	9.06	9.75	9.53	ns	27.58	24.41	57.33	6.61	ns
10	1	1.83	2.38	2.52	2.58	2.67	3.26	3.34	ns	4.93	5.33	7.80	5.60	7.77
11	1	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	8.44	ns	ns
12	1	4.98	4.52	ns	ns	ns	ns	ns	6.81	8.19	8.90	11.55	10.16	8.69
13	1	4.32	4.43	4.91	ns	ns	ns	ns	16.35	37.68	32.68	37.67	ns	ns
14	1	4.70	4.08	4.54	4.67	5.28	5.65	6.49	7.28	9.45	10.84	20.07	12.28	14.45
15	1	ns	2.18	3.28	3.49	3.93	4.56	5.27	ns	6.03	7.26	7.07	7.86	8.11
16	1	1.77	1.50	1.68	1.87	2.07	2.34	2.76	3.37	3.85	4.51	7.13	5.10	5.86
	Mean	**3.52**	**4.75**	**4.58**	**3.15**	**4.60**	**5.11**	**5.48**	**8.45**	**13.96**	**13.42**	**19.63**	**7.94**	**8.98**
17	1	10.77	10.34	10.71	10.63	9.97	10.69	12.53	ns	24.18	15.48	33.16	13.53	14.44
18	1	10.08	8.75	ns	ns	ns	ns	8.36	8.38	8.92	9.16	14.12	8.67	10.61
19	1	ns	ns	ns	ns	ns	5.55	8.31	ns	26.62	22.72	5.28	ns	ns
20	1	ns	ns	ns	3.92	ns	5.26	5.60	4.99	5.89	5.65	ns	6.63	7.33
21	1	2.11	3.87	4.74	3.95	4.18	3.54	3.47	3.25	3.48	3.98	5.06	4.82	4.97
22	1	ns	ns	ns	ns	6.44	7.79	7.18	8.71	9.19	8.28	9.36	8.15	7.45
23	1	ns	ns	ns	ns	ns	ns	ns	ns	5.99	ns	ns	ns	ns
24	1	4.86	4.55	4.73	4.10	4.28	4.37	4.49	4.99	ns	6.68	25.36	6.79	9.15
	Mean	**6.96**	**6.88**	**6.73**	**5.65**	**6.22**	**6.20**	**7.13**	**6.06**	**12.04**	**10.28**	**15.39**	**8.10**	**8.99**
Overall mean		**4.57**	**5.02**	**5.24**	**5.12**	**6.20**	**7.26**	**7.63**	**13.47**	**17.56**	**14.68**	**20.72**	**10.85**	9.23
Effective Rainfall (mm/wk)		40.6	13.4	17.32	4.55	23.89	16.95	30.55	16.76	33.55	12.15	20.07	46.40	11.48

Appendix 11…continued: Effect of treatment (Dirty water = 1; 2-Cut = 2; Grazed = 3; 1-Cut = 4) on NO_3-N concentrations (mg/l) for each cup and all treatments in the drainage year November 2003 to May 2004; Effective rainfall (mm/week) (Concentrations in red > MAC; ns = no sample).

Cup	Treatment	18/2/04	25/2/04	4/3/04	9/3/04	16/3/04	23/3/04	31/3/04	7/4/04	13/4/04	20/4/04	28/4/04	4/5/04	11/5/04
1	1	1.72	1.3	ns	ns	ns	ns	ns	ns	3.09	ns	3.36	ns	ns
2	1	13.39	9.66	11.35	ns	8.81	10.03	9.45	8.82	8.16	ns	9.19	7.44	ns
3	1	10.17	ns	ns	ns	ns		ns	ns	ns	ns	ns	ns	ns
4	1	13.43	11.11	13.75	12.48	13.60	16.04	ns	15.52	14.16	1.77	12.05	2.56	7.91
5	1	8.49	7.94	7.91	7.72	6.73	3.85	ns	3.04	2.76	2.87	2.26	1.81	1.96
6	1	ns	ns	ns	ns	ns	ns	ns	ns	ns	3.04	ns	ns	ns
7	1	ns	48.44	ns	ns	42.05	25.41	ns	20.42	18.51	15.30	13.62	3.51	14.56
8	1	16.5	12.78	ns	10.93	ns	22.64	ns	17.07	12.44	10.62	12.19	ns	ns
	Mean	**10.62**	**15.21**	**11.00**	**10.38**	**17.80**	**15.59**	**9.45**	**12.97**	**9.85**	**6.72**	**8.78**	**3.83**	**8.15**
9	1	39.18	33.89	ns	33.72	29.93	28.86	ns	ns	25.06	19.29	17.95	3.51	ns
10	1	7.45	7.87	ns	ns	8.22	8.37	ns	8.93	8.81	8.11	8.59	7.45	6.88
11	1	ns	ns	ns	ns	ns	9.10	ns	ns	ns	ns	ns	ns	ns
12	1	ns	ns	ns	ns	ns	9.86	ns	9.98	10.23	8.84	12.40	9.88	10.89
13	1	ns	ns	ns	ns	34.15	31.23	29.25	25.82	20.27	18.48	22.17	16.99	ns
14	1	ns	14.06	17.29	14.16	15.35	12.90	12.28	ns	8.77	9.62	8.73	7.17	7.29
15	1	7.43	7.61	6.56	ns	ns	ns	ns	ns	ns	2.93	5.08	4.96	4.95
16	1	4.87	3.89	3.65	3.50	ns	3.75	ns	ns	3.53	3.40	3.38	4.18	5.06
	Mean	**14.73**	**13.46**	**9.17**	**17.13**	**21.91**	**14.87**	**20.77**	**14.91**	**12.78**	**10.10**	**11.19**	**7.73**	**7.01**
17	1	16.23	12.74	ns	ns	ns	15.18	ns	17.16	12.96	11.59	15.63	13.65	15.26
18	1	9.49	10.71	ns	ns	ns	ns	ns	13.67	8.99	ns	ns	10.13	10.90
19	1	ns	38.33	ns	ns	ns	ns	ns	41.13	37.37	ns	ns	ns	ns
20	1	ns	ns	5.38	ns	10.14	ns	ns	10.7	ns	ns	8.73	ns	ns
21	1	5.30	4.80	ns	5.51	ns	4.87	ns	5.14	5.40	ns	ns	ns	ns
22	1	6.00	5.73	5.68	5.57	ns	4.97	ns	3.52	2.92	2.53	1.87	2.22	1.44
23	1	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
24	1	ns	ns	10.94	10.93	10.45	10.83	10.1	11.35	9.77	8.56	11.87	3.26	8.57
	Mean	**9.26**	**14.46**	**7.33**	**7.34**	**10.30**	**8.96**	**10.10**	**14.67**	**12.90**	**7.56**	**9.52**	**7.31**	**9.04**
	Overall mean	**11.53**	**14.38**	**9.17**	**11.61**	**16.67**	**13.14**	**13.44**	**14.18**	**11.84**	**8.13**	**9.83**	**6.29**	8.07
Effective Rainfall (mm/wk)		3.60	0.00	2.04	0.00	56.35	17.47	0.00	3.86	0.00	12.12	14.89	0.00	0.00

Appendix 11…continued: Effect of treatment (Dirty water = 1; 2-Cut = 2; Grazed = 3; 1-Cut = 4) on NO_3-N concentrations (mg/l) for each cup and all treatments in the drainage year November 2003 to May 2004; Effective rainfall (mm/week) (Concentrations in red > MAC; ns = no sample).

Cup	Treatment	19/11/03	26/11/03	3/12/03	10/12/03	17/12/03	23/12/03	30/12/03	7/1/04	14/1/04	21/1/04	28/1/04	4/2/04	11/2/04
25	2	3.17	ns	3.66	ns	2.79	ns	ns	ns	3.47	3.13	3.43	ns	ns
26	2	4.98	4.59	6.86	ns	3.20	3.78	3.72	ns	3.82	3.63	3.41	3.49	4.63
27	2	5.13	2.39	1.67	1.15	1.09	0.66	0.89	0.84	0.93	0.69	ns	0.29	0.97
28	2	6.58	22.34	ns	ns	ns	58.77	82.70	ns	163.51	219.79	1.16	192.00	158.43
29	2	18.90	16.21	13.23	12.51	13.65	ns	ns	14.85	24.58	13.74	12.56	10.16	8.42
30	2	4.40	4.42	ns	3.90	4.13	ns	5.70	5.94	7.35	6.85	7.02	ns	6.10
31	2	0.60	0.76	0.98	1.14	1.48	1.25	1.54	ns	2.47	1.77	1.78	1.72	1.77
32	2	ns	ns	ns	ns	ns	ns	ns	ns	ns	3.03	2.58	ns	2.50
	Mean	**6.25**	**8.45**	**5.28**	**4.68**	**4.39**	**16.12**	**18.91**	**7.21**	**29.45**	**31.58**	**4.56**	**41.53**	**26.12**
33	2	ns	13.33	ns	8.82	ns	ns	ns	10.18	22.59	10.27	ns	10.23	9.84
34	2	ns	1.27	ns	ns	ns	ns	ns	ns	3.56	ns	ns	4.70	4.65
35	2	ns	5.00	11.12	ns	ns	14.85	15.93	ns	25.10	12.94	9.67	ns	ns
36	2	ns	1.19	0.92	ns	ns	1.58	2.13	ns	3.15	2.71	ns	3.81	4.63
37	2	2.48	2.57	2.08	1.33	1.54	1.33	1.83	ns	2.16	1.64	6.55	1.67	2.57
38	2	0.82	0.68	0.85	ns	2.00	1.92	1.99	ns	3.16	2.57	ns	ns	1.98
39	2	ns	14.42	9.28	6.23	5.21	4.03	3.49	ns	3.69	2.49	5.50	0.55	2.94
40	2	ns	ns	4.63	ns	ns	4.70	4.90	ns	5.23	5.64	ns	ns	ns
	Mean	**1.65**	**5.49**	**4.81**	**5.46**	**2.92**	**4.74**	**5.05**	**10.18**	**8.58**	**5.47**	**7.24**	**4.19**	**4.44**
41	2	1.92	2.07	1.89	1.68	1.91	1.84	2.06	1.85	2.50	2.10	2.13	1.75	1.76
42	2	ns	ns	6.45	ns	4.73	4.81	6.67	ns	9.10	8.13	8.02	8.22	7.98
43	2	ns	8.92	9.74	ns	8.19	ns	ns	7.31	8.68	7.99	ns	9.00	ns
44	2	3.35	3.34	ns	2.84	3.32	ns	ns	4.65	5.68	5.13	5.05	ns	4.46
45	2	5.38	7.08	7.90	8.56	9.05	9.71	10.59	9.69	12.14	13.05	13.83	2.79	10.30
46	2	9.37	7.44	7.00	7.22	6.58	5.74	5.48	ns	ns	6.69	6.40	6.27	5.45
47	2	ns	0.58	0.64	ns	ns	0.95	1.02	1.25	2.17	1.37	ns	1.46	1.45
48	2	1.80	0.99	0.59	0.61	0.60	0.70	ns	1.36	2.34	4.39	18.44	3.26	ns
	Mean	**4.36**	**4.35**	**4.89**	**4.18**	**4.91**	**3.96**	**5.16**	**4.35**	**6.09**	**6.11**	**8.98**	**4.68**	**5.23**
	Overall mean	**4.09**	**6.10**	**4.99**	**4.77**	**4.07**	**8.27**	**9.71**	**7.25**	**14.70**	**14.38**	**6.93**	**16.80**	11.93
Effective Rainfall (mm/wk)		40.6	13.4	17.32	4.55	23.89	16.95	30.55	16.76	33.55	12.15	20.07	46.40	11.48

Appendix 11…continued: Effect of treatment (Dirty water = 1; 2-Cut = 2; Grazed = 3; 1-Cut = 4) on NO_3-N concentrations (mg/l) for each cup and all treatments in the drainage year November 2003 to May 2004; Effective rainfall (mm/week) (Concentrations in red > MAC; ns = no sample).

Cup	Treatment	18/2/04	25/2/04	4/3/04	9/3/04	16/3/04	23/3/04	31/3/04	7/4/04	13/4/04	20/4/04	28/4/04	4/5/04	11/5/04
25	2	ns	ns		ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
26	2	3.83	3.08	3.09	3.40	ns	2.28	ns	ns	ns	4.20	4.02	4.17	4.47
27	2	1.34	0.00	1.30	1.17	0.97	0.90	1.31	0.74	1.00	1.48	1.88	1.73	1.95
28	2	165.73	112.68	99.99	87.67	74.64	ns	ns	ns	ns	ns	ns	ns	ns
29	2	10.08	8.74	ns	ns	ns	10.75	ns	13.6	11.32	10.83	11.76	7.45	10.34
30	2	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
31	2	2.05	2.72	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
32	2	2.13	1.94	2.29	2.42	ns	3.16	ns	3.66	4.11	3.85	ns	ns	ns
	Mean	**30.86**	**21.53**	**26.67**	**23.67**	**37.81**	**4.27**	**1.31**	**6.00**	**5.48**	**5.09**	**5.88**	**4.45**	**5.59**
33	2	9.85	8.37	ns	ns	ns	ns	ns	7.62	ns	7.56	ns	7.93	ns
34	2	ns	ns	ns	ns	ns	ns	ns	6.03	ns	ns	ns	ns	ns
35	2	ns	ns	ns	ns	5.92	ns	ns	5.42	ns	ns	5.13	6.12	5.33
36	2	5.25	4.77	4.24	4.92	ns	ns	ns	4.27	4.34	ns	ns	4.77	4.67
37	2	1.58	2	2.32	2.76	2.63	2.45	2.32	2.04	1.99	1.95	1.90	1.77	1.65
38	2	2.19	2.17	2.41	3.51	ns	ns	ns	ns	ns	ns	ns	3.55	ns
39	2	2.52	1.95	2.02	2.56	2.65	ns	ns	3.27	2.80	1.90	4.07	4.37	3.48
40	2	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
	Mean	**4.28**	**3.85**	**2.75**	**3.44**	**3.73**	**2.45**	**2.32**	**4.78**	**3.04**	**3.80**	**3.70**	**4.75**	**3.78**
41	2	1.46	1.33	1.50	1.79	ns	1.78	ns	1.44	0.61	0.76	0.64	0.53	0.55
42	2	7.69	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	7.38	6.82
43	2	ns	ns	ns	ns	ns	ns	ns	10.65	10.33	ns	ns	ns	ns
44	2	4.13	4.59	ns	ns	ns	4.27	ns	ns	ns	ns	ns	4.71	ns
45	2	11.04	ns	11.04	10.52	10.74	8.32	9.3	10.37	6.65	10.41	ns	ns	ns
46	2	5.27	5.5	ns	5.83	ns	8.58	ns	ns	8.42	7.71	ns	ns	ns
47	2	1.62	1.68	2.36	2.43	ns	ns	ns	3.57	3.98	ns	ns	ns	ns
48	2	ns	ns	ns	64.11	ns	57.95	49.42	46.72	35.53	25.13	17.96	0.00	13.40
	Mean	**5.20**	**3.28**	**4.97**	**16.94**	**10.74**	**16.18**	**29.36**	**14.55**	**10.92**	**11.00**	**9.30**	**3.15**	**6.93**
	Overall mean	**13.45**	**9.55**	**11.46**	**14.68**	**17.43**	**7.63**	**11.00**	**8.44**	**6.48**	**6.63**	**6.30**	**4.12**	5.43
Effective Rainfall (mm/wk)		3.60	0.00	2.04	0.00	56.35	17.47	0.00	3.86	0.00	12.12	14.89	0.00	0.00

Appendix 11…continued: Effect of treatment (Dirty water = 1; 2-Cut = 2; Grazed = 3; 1-Cut = 4) on NO_3-N concentrations (mg/l) for each cup and all treatments in the drainage year November 2003 to May 2004; Effective rainfall (mm/week) (Concentrations in red > MAC; ns = no sample).

Cup	Treatment	**19/11/03**	**26/11/03**	**3/12/03**	**10/12/03**	**17/12/03**	**23/12/03**	**30/12/03**	**7/1/04**	**14/1/04**	**21/1/04**	**28/1/04**	**4/2/04**	11/2/04
49	3	1.27	2.05	2.12	ns	3.19	3.25	3.14	ns	5.01	4.11	4.59	ns	ns
50	3	9.05	9.88	9.98	8.81	7.88	7.60	6.94	ns	8.47	7.21	7.61	7.94	8.13
51	3	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
52	3	25.22	24.23	16.31	10.25	7.46	5.86	ns	ns	5.69	4.03	3.48	2.82	2.41
53	3	0.64	0.81	0.88	ns	0.79	0.79	ns	ns	2.29	1.43	1.41	ns	ns
54	3	4.30	4.05	4.65	4.42	4.59	ns	4.37	4.03	4.34	3.45	3.44	ns	2.94
55	3	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
56	3	5.00	2.49	2.67	ns	ns	ns	ns	2.15	2.25	0.96	1.75	8.61	11.77
	Mean	**7.58**	**7.25**	**6.10**	**7.83**	**4.78**	**4.38**	**4.82**	**3.09**	**4.68**	**3.53**	**3.71**	**6.46**	**6.31**
57	3	6.96	ns	ns	ns	ns	ns	ns	8.82	10.92	16.77	17.09	2.42	ns
58	3	4.57	4.23	4.49	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
59	3	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
60	3	0.49	0.38	0.48	0.46	0.48	0.44	ns	0.78	1.48	0.86	1.14	0.00	ns
61	3	3.23	2.67	2.38	2.30	2.37	2.27	2.66	ns	4.23	ns	3.96	4.51	4.43
62	3	0.30	0.34	0.45	0.60	0.96	1.03	1.43	1.48	2.45	1.99	2.48	ns	1.63
63	3	ns	ns	ns	3.46	3.40	ns	2.97	3.37	3.70	3.50	4.56	4.73	5.74
64	3	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
	Mean	**3.11**	**1.91**	**1.95**	**1.71**	**1.80**	**1.25**	**2.35**	**3.61**	**4.56**	**5.78**	**5.85**	**2.92**	**3.93**
65	3	1.19	1.82	1.91	1.71	1.82	ns	ns	2.34	2.98	2.37	3.52	1.67	2.76
66	3	ns	ns	3.94	ns	ns	ns	ns	ns	32.26	39.54	41.41	37.96	33.95
67	3	4.91	5.42	6.33	ns	ns	ns	ns	ns	ns	ns	ns	ns	21.69
68	3	0.41	ns	0.56	0.22	0.30	0.20	0.32	0.44	1.03	0.35	0.51	0.53	0.92
69	3	6.30	6.18	7.77	9.59	15.82	16.04	18.35	21.33	ns	21.91	22.54	18.88	25.14
70	3	1.16	2.04	5.16	9.28	23.80	ns	ns	72.51	97.47	90.49	104.18	51.84	ns
71	3	2.10	1.64	1.54	1.78	3.22	4.79	5.98	ns	9.46	8.43	9.62	7.39	8.77
72	3	6.64	9.96	9.25	8.21	7.20	6.23	5.75	ns	5.87	5.15	6.51	5.14	5.30
	Mean	**3.24**	**4.51**	**4.56**	**5.13**	**8.69**	**6.82**	**7.60**	**24.16**	**24.85**	**24.03**	**26.90**	**17.63**	**14.08**
	Overall mean	**4.64**	**4.56**	**4.20**	**4.89**	**5.09**	**4.15**	**4.92**	**10.29**	**11.36**	**11.12**	**12.15**	**9.00**	8.11
Effective Rainfall (mm/wk)		40.6	13.4	17.32	4.55	23.89	16.95	30.55	16.76	33.55	12.15	20.07	46.40	11.48

Appendix 11…continued: Effect of treatment (Dirty water = 1; 2-Cut = 2; Grazed = 3; 1-Cut = 4) on NO_3-N concentrations (mg/l) for each cup and all treatments in the drainage year November 2003 to May 2004; Effective rainfall (mm/week) (Concentrations in red > MAC; ns = no sample).

Cup	Treatment	18/2/04	25/2/04	4/3/04	9/3/04	16/3/04	23/3/04	31/3/04	7/4/04	13/4/04	20/4/04	28/4/04	4/5/04	11/5/04
49	3	ns	ns	ns	ns	ns	5.98	6.08	5.47	ns	ns	ns	ns	ns
50	3	7.69	8.33	8.46	ns	ns	9.68	10.16	10.52	10.40	7.61	32.93	10.24	9.43
51	3	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
52	3	2.56	3.25	ns	ns	ns	ns	6.58	7.03	ns	ns	ns	ns	ns
53	3	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
54	3	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
55	3	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
56	3	9.37	ns	ns	ns	ns	0.81	ns	0.52	0.10	0.11	0.00	0.20	0.00
	Mean	**6.54**	**5.79**	**8.46**	**ns**	**ns**	**5.49**	**7.61**	**5.89**	**5.25**	**3.86**	**16.47**	**5.22**	**4.71**
57	3	ns	ns	ns	ns	ns	13.61	15.60	17.28	ns	14.02	ns	ns	ns
58	3	ns	ns	ns	ns	ns	10.02	12.66	ns	ns	ns	ns	ns	ns
59	3	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
60	3	ns	ns	ns	ns	ns	1.53	2.80	1.67	1.58	ns	ns	ns	3.12
61	3	4.93	5.22	ns	ns	ns	7.55	7.55	8.86	ns	ns	ns	ns	ns
62	3	1.78	1.78	2.02	2.20	2.17	2.45	3.51	4.00	4.34	4.19	4.34	4.07	3.45
63	3	6.58	7.0	6.71	7.09	ns	7.59	8.30	8.79	8.81	9.01	7.89	ns	ns
64	3	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
	Mean	**4.43**	**4.67**	**4.37**	**4.65**	**2.17**	**7.13**	**8.40**	**8.12**	**4.91**	**9.07**	**6.11**	**4.07**	**3.28**
65	3	ns	ns	3.64	3.61	3.89	5.01	ns	7.40	8.18	9.16	9.22	ns	10.23
66	3	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
67	3	ns	ns	ns	ns	11.68	9.74	ns	11.83	10.54	10.33	8.88	7.73	6.94
68	3	1.04	1.12	1.33	1.17	3.06	1.78	ns	1.34	1.20	1.66	1.62	1.37	1.05
69	3	16.51	12.54	ns	ns	18.07	18.59	ns	21.83	22.92	20.43	31.28	0.00	20.21
70	3	ns	ns	ns	ns	21.69	13.12	ns	ns	ns	ns	ns	ns	ns
71	3	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
72	3	ns	ns	ns	ns	ns	6.40	ns	7.84	ns	7.43	ns	ns	ns
	Mean	**8.78**	**6.83**	**2.49**	**2.39**	**11.68**	**9.11**	**ns**	**10.05**	**10.71**	**9.80**	**12.75**	**3.03**	**9.61**
	Overall mean	**6.58**	**5.76**	**5.10**	**3.52**	**6.93**	**7.24**	**8.01**	**8.02**	**6.96**	**7.58**	**11.78**	**4.11**	5.87
Effective Rainfall (mm/wk)		3.60	0.00	2.04	0.00	56.35	17.47	0.00	3.86	0.00	12.12	14.89	0.00	0.00

Appendix 11…continued: Effect of treatment (Dirty water = 1; 2-Cut = 2; Grazed = 3; 1-Cut = 4) on NO_3-N concentrations (mg/l) for each cup and all treatments in the drainage year November 2003 to May 2004; Effective rainfall (mm/week) (Concentrations in red > MAC; ns = no sample).

Cup	Treatment	19/11/03	26/11/03	3/12/03	10/12/03	17/12/03	23/12/03	30/12/03	7/1/04	14/1/04	21/1/04	28/1/04	4/2/04	11/2/04
73	4	ns	2.48	2.74	3.64	6.70	9.82	23.34	43.00	53.25	55.74	71.53	40.45	44.92
74	4	0.25	0.21	0.25	0.38	0.55	0.46	0.67	1.03	1.49	0.75	1.57	1.17	2.02
75	4	7.84	7.72	7.36	ns	ns	ns	ns	2.71	2.56	1.41	2.00	1.10	0.83
76	4	0.15	0.26	0.30	ns	0.34	0.24	0.36	ns	1.03	0.19	0.23	0.14	1.16
77	4	1.47	10.34	10.45	ns	ns	ns	ns	41.44	36.33	26.99	ns	0.30	ns
78	4	ns	ns	ns	ns	ns	ns	ns	2.88	4.12	4.36	ns	ns	5.26
79	4	3.94	2.63	1.60	1.20	1.08	1.13	1.15	1.25	1.98	1.55	2.24	ns	ns
80	4	0.83	0.88	0.96	0.98	0.96	0.97	1.83	3.27	4.55	2.66	2.87	1.67	1.70
	Mean	**2.41**	**3.50**	**3.38**	**1.55**	**1.93**	**2.52**	**5.47**	**13.65**	**13.16**	**11.71**	**13.41**	**7.47**	**9.32**
81	4	2.44	2.18	2.39	3.01	3.14	3.48	3.69	4.58	6.02	6.44	9.38	1.03	ns
82	4	0.21	0.11	0.15	0.16	0.20	0.15	ns	0.28	1.30	0.40	0.51	0.46	0.43
83	4	ns	0.69	1.02	ns	2.07	0.62	ns	3.83	4.98	6.79	ns	ns	9.28
84	4	ns	0.45	0.36	0.35	0.43	ns	ns	ns	2.51	2.53	ns	2.74	3.49
85	4	32.36	24.18	16.95	ns	18.22	ns	ns	19.92	21.98	23.26	3.15	24.92	35.72
86	4	3.38	5.65	6.60	ns	6.82	ns	ns	14.95	10.85	17.70	23.89	18.10	25.56
87	4	ns	ns	ns	ns	ns	ns	0.22	ns	18.65	43.53	97.70	115.88	152.87
88	4	1.13	2.14	3.45	4.38	5.09	6.08	ns	ns	8.33	11.33	13.95	10.79	10.52
	Mean	**7.90**	**5.06**	**4.42**	**1.98**	**5.14**	**2.58**	**1.96**	**8.71**	**9.33**	**14.00**	**24.76**	**24.85**	**33.98**
89	4	ns	ns	ns	ns	ns	ns	1.15	ns	3.49	3.68	ns	ns	ns
90	4	ns	1.98	ns	ns	ns	ns	ns	3.26	0.80	5.25	7.79	7.83	8.37
91	4	0.11	0.12	0.11	0.00	0.00	ns	0.00	0.00	0.81	0.00	0.00	ns	ns
92	4	3.55	2.30	2.11	1.90	1.97	1.61	1.70	ns	2.74	2.04	2.19	1.72	2.05
93	4	11.78	10.09	14.26	13.13	10.91	9.46	8.59	ns	8.17	7.35	10.51	7.86	22.02
94	4	0.78	0.61	0.54	0.47	0.47	0.43	0.59	0.43	1.03	0.52	ns	ns	0.58
95	4	ns	1.44	1.08	ns	ns	ns	2.39	1.64	1.70	0.82	1.21	0.69	0.61
96	4	0.77	0.59	0.65	0.69	0.70	0.60	0.79	0.73	1.52	1.13	1.36	1.22	1.32
	Mean	**3.40**	**2.45**	**3.13**	**3.24**	**2.81**	**3.03**	**2.17**	**1.21**	**2.53**	**2.60**	**3.84**	**3.86**	**5.83**
	Overall mean	**4.57**	**3.67**	**3.64**	**2.25**	**3.29**	**2.71**	**3.20**	**7.86**	**8.34**	**9.43**	**14.00**	**12.06**	16.37
Effective Rainfall (mm/wk)		40.6	13.4	17.32	4.55	23.89	16.95	30.55	16.76	33.55	12.15	20.07	46.40	11.48

Appendix 11…continued: Effect of treatment (Dirty water = 1; 2-Cut = 2; Grazed = 3; 1-Cut = 4) on NO_3-N concentrations (mg/l) for each cup and all treatments in the drainage year November 2003 to May 2004; Effective rainfall (mm/week) (Concentrations in red > MAC; ns = no sample).

Cup	Treatment	18/2/04	25/2/04	4/3/04	9/3/04	16/3/04	23/3/04	31/3/04	7/4/04	13/4/04	20/4/04	28/4/04	4/5/04	11/5/04
73	4	33.15	28.38	29.56	29.28	30.56	25.54	ns	24.33	22.92	18.15	31.49	5.08	18.83
74	4	1.92	1.67	1.15	0.90	ns	0.46	ns	0.37	0.58	0.72	0.50	ns	ns
75	4	1.22	ns	ns	ns	ns	ns	ns	2.47	2.40	ns	2.54	ns	ns
76	4	ns	ns	ns	ns	ns	0.00	ns	0.33	ns	ns	ns	ns	ns
77	4	ns	ns	ns	ns	ns	ns	0.54	ns	ns	ns	ns	ns	ns
78	4	ns	ns	ns	4.86	ns	ns	4.26	ns	ns	ns	ns	ns	ns
79	4	1.91	ns	2.23	ns	ns	2.09	2.33	2.02	2.00	1.86	1.75	2.06	2.44
80	4	1.81	1.73	ns	ns	ns	2.01	ns	0.7	0.41	0.45	0.70	ns	ns
	Mean	**8.00**	**10.59**	**10.98**	**11.68**	**30.56**	**6.02**	**2.38**	**5.04**	**5.66**	**5.30**	**7.40**	**3.57**	**10.64**
81	4	ns	ns	ns	ns	ns	10.28	ns	ns	ns	ns	ns	ns	ns
82	4	ns	ns	ns	ns	ns	0.00	ns	ns	0.00	0.00	ns	ns	0.15
83	4	ns	ns	ns	ns	ns	9.65	ns	ns	ns	ns	ns	ns	ns
84	4	4.64	5.26	5.15	5.04	5.07	4.13	3.85	3.59	3.88	4.18	2.99	3.11	3.34
85	4	ns	ns	ns	ns	ns	19.38	ns	22.57	21.82	ns	ns	0.00	ns
86	4	ns	ns	ns	ns	ns	19.96	ns	ns	ns	ns	22.18	ns	ns
87	4	ns	163.52	ns	ns	154.87	ns	ns	178.83	ns	ns	47.91	ns	ns
88	4	8.29	8.91	9.24	7.85	9.14	10.71	ns	9.76	8.89	10.44	ns	ns	8.13
	Mean	**6.47**	**59.23**	**7.20**	**6.45**	**56.36**	**10.59**	**3.85**	**53.69**	**8.65**	**4.87**	**24.36**	**1.55**	**3.88**
89	4	174.6	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
90	4	7.70	ns	ns	7.80	8.73	9.18	9.35	9.91	9.80	9.79	9.50	8.84	7.96
91	4	ns	7.14	0.00	0.00	ns	0.00	0.00	0.00	0.00	0.00	0.11	0.00	0.13
92	4	2.73	4.11	ns	ns	ns	ns	ns	ns	10.09	9.11	7.91	5.28	5.24
93	4	ns	ns	ns	ns	ns	8.89	ns	8.81	10.50	ns	6.89	6.59	ns
94	4	ns	0.00	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
95	4	ns	ns	ns	ns	ns	ns	ns	0.39	0.88	ns	1.04	ns	ns
96	4	1.16	0.99	5.49	ns	ns	0.56	ns	1.91	2.55	3.15	2.87	2.99	3.31
	Mean	**46.55**	**3.06**	**2.75**	**3.90**	**8.73**	**4.66**	**4.68**	**4.20**	**5.64**	**5.51**	**4.72**	**4.74**	**4.16**
	Overall mean	**20.34**	**24.29**	**6.98**	**7.34**	**31.88**	**7.09**	**3.63**	**20.98**	**6.65**	**5.23**	**12.16**	**3.29**	6.22
Effective Rainfall (mm/wk)		3.60	0.00	2.04	0.00	56.35	17.47	0.00	3.86	0.00	12.12	14.89	0.00	0.00

Appendix 12: Effect of treatment (Dirty water = 1; 2-Cut = 2; Grazed = 3; 1-Cut = 4) on NH_4-N concentrations (mg/l) for each cup and all treatments in the drainage year November 2003 to May 2004; Effective rainfall (mm/week) (Concentrations in red > MAC; ns = no sample).

Cup	Treatment	19/11/03	26/11/03	3/12/03	10/12/03	17/12/03	23/12/03	30/12/03	7/1/04	14/1/04	21/1/04	28/1/04	4/2/04	11/2/04
1	1	ns	ns	ns	ns	ns	ns	0.18	ns	0.00	ns	ns	0.00	0.00
2	1	ns	0.43	0.36	0.25	0.13	0.11	0.36	0.37	0.31	0.26	0.70	0.33	0.26
3	1	14.26	3.62	0.35	0.00	0.00	0.00	0.26	ns	ns	0.56	0.97	0.27	0.34
4	1	3.66	0.00	0.00	ns	0.38	0.00	0.27	ns	ns	0.27	0.68	0.17	0.23
5	1	0.30	0.00	0.00	0.00	0.00	0.00	0.12	ns	0.16	0.00	0.00	0.00	0.00
6	1	ns	ns	1.74	ns	ns	ns	ns	ns	0.88	0.52	ns	0.65	0.54
7	1	0.40	0.00	ns	0.00	0.00	0.00	0.76	0.14	0.18	0.00	0.11	0.13	ns
8	1	3.77	0.25	0.22	ns	0.72	0.38	0.44	0.58	0.38	0.29	0.57	ns	0.55
	Mean	**4.48**	**0.72**	**0.45**	**0.06**	**0.21**	**0.08**	**0.34**	**0.36**	**0.32**	**0.27**	**0.51**	**0.22**	**0.27**
9	1	ns	0.53	0.25	ns	0.65	0.23	0.39	ns	0.60	0.15	0.51	0.00	ns
10	1	1.04	0.00	0.00	0.00	0.00	0.00	0.11	ns	0.00	0.00	0.12	0.00	0.00
11	1	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	3.86	ns	ns
12	1	0.00	0.00	ns	ns	ns	ns	ns	0.00	0.00	0.00	0.00	0.00	0.11
13	1	2.46	0.00	0.00	ns	ns	ns	ns	0.14	0.00	0.00	0.11	ns	ns
14	1	0.96	0.00	0.00	0.00	0.00	0.00	0.10	0.17	0.23	0.00	0.18	0.10	0.13
15	1	ns	1.33	0.00	0.00	0.00	0.00	0.22	ns	0.15	0.14	0.19	0.15	0.15
16	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Mean	**0.89**	**0.27**	**0.04**	**0.00**	**0.13**	**0.05**	**0.16**	**0.08**	**0.14**	**0.04**	**0.62**	**0.04**	**0.08**
17	1	0.59	0.12	0.00	0.00	0.00	0.00	0.15	ns	0.12	0.26	0.17	0.00	0.15
18	1	0.00	0.00	ns	ns	ns	ns	0.00	0.00	0.00	0.11	0.00	0.00	0.11
19	1	ns	ns	ns	ns	ns	8.80	1.17	ns	1.15	0.45	0.28	ns	ns
20	1	ns	ns	ns	0.33	ns	0.27	0.12	0.13	0.00	0.00	ns	0.11	0.00
21	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.19	0.11	0.13	0.19
22	1	ns	ns	ns	ns	0.00	0.00	0.22	0.10	0.00	0.00	0.00	0.00	0.00
23	1	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
24	1	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.00	0.00	0.21	0.00	0.00
	Mean	**0.23**	**0.03**	**0.00**	**0.08**	**0.00**	**1.51**	**0.24**	**0.07**	**0.20**	**0.14**	**0.13**	**0.04**	**0.08**
Overall mean		**1.87**	**0.34**	**0.16**	**0.05**	**0.11**	**0.55**	**0.25**	**0.17**	**0.22**	**0.15**	**0.42**	**0.10**	0.14
Effective Rainfall (mm/wk)		40.6	13.4	17.32	4.55	23.89	16.95	30.55	16.76	33.55	12.15	20.07	46.40	11.48

Appendix 12…continued: Effect of treatment (Dirty water = 1; 2-Cut = 2; Grazed = 3; 1-Cut = 4) on NH_4-N concentrations (mg/l) for each cup and all treatments in the drainage year November 2003 to May 2004; Effective rainfall (mm/week) (Concentrations in red > MAC; ns = no sample).

Cup	Treatment	18/2/04	25/2/04	4/3/04	9/3/04	16/3/04	23/3/04	31/3/04	7/4/04	13/4/04	20/4/04	28/4/04	4/5/04	11/5/04
1	1	0.00	0.00	ns	ns	ns	ns	ns	ns	0.00	ns	0.00	ns	ns
2	1	0.53	0.53	0.43	ns	0.34	1.10	3.33	0.45	0.65	ns	1.03	0.32	ns
3	1	0.48	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
4	1	0.31	0.22	0.18	0.18	0.25	1.09	ns	0.18	0.00	0.23	0.00	0.00	0.30
5	1	0.15	0.00	0.00	0.00	0.00	0.16	ns	0.25	0.14	0.24	0.15	0.16	0.18
6	1	ns	ns	ns	ns	ns	ns	ns	ns	ns	0.00	ns	ns	ns
7	1	ns	0.14	ns	ns	0.16	0.00	ns	0.21	0.00	0.00	0.00	0.00	0.00
8	1	0.21	0.00	ns	0.59	ns	0.35	ns	0.18	0.00	0.24	0.22	ns	ns
	Mean	**0.28**	**0.15**	**0.20**	**0.26**	**0.19**	**0.54**	**3.33**	**0.25**	**0.13**	**0.14**	**0.23**	**0.12**	**0.16**
9	1	0.86	0.18	ns	1.24	0.00	0.41	ns	ns	0.44	0.42	0.23	0.25	ns
10	1	0.20	0.14	ns	ns	1.32	0.23	ns	0.24	0.00	0.24	0.15	0.14	0.17
11	1	ns	ns	ns	ns	ns	1.15	ns	ns	ns	ns	ns	ns	ns
12	1	ns	ns	ns	ns	ns	0.00	ns	0.00	0.11	0.00	0.00	0.00	0.00
13	1	ns	ns	ns	ns	0.31	0.20	0.3	0.00	0.00	0.18	0.00	0.16	ns
14	1	ns	0.28	0.59	0.00	0.00	0.00	0.00	ns	0.00	0.00	0.00	0.00	0.00
15	1	0.17	0.13	0.14	ns	ns	ns	ns	ns	ns	0.91	0.11	0.00	0.29
16	1	0.12	0.00	0.00	0.00	ns	0.16	ns	ns	0.26	0.00	0.13	0.00	0.00
	Mean	**0.34**	**0.15**	**0.24**	**0.41**	**0.41**	**0.31**	**0.15**	**0.08**	**0.14**	**0.25**	**0.09**	**0.08**	**0.09**
17	1	0.19	0.00	ns	ns	ns	0.21	ns	0.15	0.00	0.00	0.00	0.00	0.15
18	1	0.00	0.00	ns	ns	ns	ns	ns	0.28	0.00	ns	ns	0.00	0.00
19	1	ns	0.59	ns	ns	ns	ns	ns	0.80	0.30	ns	ns	ns	ns
20	1	ns	ns	0.12	ns	0.18	ns	ns	0.19	ns	ns	0.00	ns	ns
21	1	0.16	0.00	ns	0.00	ns	0.31	ns	0.25	0.00	ns	ns	ns	ns
22	1	0.00	0.14	0.16	0.00	ns	0.13	ns	0.24	0.00	0.00	0.00	0.00	0.00
23	1	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
24	1	ns	ns	0.21	0.00	0.00	0.00	0.17	0.00	0.00	0.00	0.00	0.00	0.00
	Mean	**0.09**	**0.15**	**0.16**	**0.00**	**0.09**	**0.16**	**0.17**	**0.27**	**0.05**	**0.00**	**0.00**	**0.00**	**0.04**
Overall mean		**0.24**	**0.15**	**0.20**	**0.22**	**0.23**	**0.34**	**1.22**	**0.20**	**0.11**	**0.13**	**0.05**	**0.07**	0.10
Effective Rainfall (mm/wk)		3.60	0.00	2.04	0.00	56.35	17.47	0.00	3.86	0.00	12.12	14.89	0.00	0.00

Appendix 12…continued: Effect of treatment (Dirty water = 1; 2-Cut = 2; Grazed = 3; 1-Cut = 4) on NH_4-N concentrations (mg/l) for each cup and all treatments in the drainage year November 2003 to May 2004; Effective rainfall (mm/week) (Concentrations in red > MAC; ns = no sample).

Cup	Treatment	19/11/03	26/11/03	3/12/03	10/12/03	17/12/03	23/12/03	30/12/03	7/1/04	14/1/04	21/1/04	28/1/04	4/2/04	11/2/04
25	2	0.62	ns	0.50	ns	0.00	ns	ns	ns	1.89	0.19	0.44	ns	ns
26	2	0.71	0.00	0.39	ns	0.00	0.34	0.38	ns	1.02	0.38	0.81	0.35	0.36
27	2	4.29	0.37	0.45	0.71	0.43	0.67	0.49	0.75	0.36	0.32	ns	0.00	0.94
28	2	1.28	0.00	ns	ns	ns	0.58	0.32	ns	0.60	0.00	0.66	0.14	0.17
29	2	2.71	0.19	0.44	0.73	0.91	ns	ns	1.10	0.27	0.00	0.00	0.00	0.00
30	2	0.46	0.00	ns	0.00	0.00	ns	0.63	0.67	0.19	0.16	0.40	ns	0.27
31	2	0.74	0.12	0.15	0.00	0.00	0.46	0.41	ns	0.54	0.36	0.57	0.42	0.39
32	2	ns	ns	ns	ns	ns	ns	ns	ns	ns	0.73	0.00	ns	0.14
	Mean	**1.54**	**0.11**	**0.39**	**0.36**	**0.22**	**0.51**	**0.45**	**0.84**	**0.70**	**0.27**	**0.41**	**0.18**	**0.32**
33	2	ns	0.39	ns	0.35	ns	ns	ns	0.53	0.18	0.29	ns	0.22	0.13
34	2	ns	2.30	ns	ns	ns	ns	ns	ns	0.42	ns	ns	0.52	0.33
35	2	ns	1.68	0.00	ns	ns	0.46	0.32	ns	0.24	0.42	0.95	ns	ns
36	2	ns	1.21	0.13	ns	ns	0.72	0.72	ns	0.00	0.00	ns	0.10	0.12
37	2	0.42	0.00	0.00	0.00	0.00	0.36	0.16	ns	0.00	0.00	0.26	0.00	0.00
38	2	0.94	0.00	0.00	ns	0.00	1.03	1.09	ns	0.26	0.16	ns	ns	0.35
39	2	ns	2.72	0.11	0.17	0.24	0.54	0.53	ns	0.53	0.35	1.15	0.26	1.26
40	2	ns	ns	1.56	ns	ns	3.18	1.18	ns	1.31	0.62	ns	ns	ns
	Mean	**0.68**	**1.19**	**0.30**	**0.17**	**0.08**	**1.05**	**0.67**	**0.53**	**0.37**	**0.26**	**0.79**	**0.22**	**0.37**
41	2	0.16	0.00	0.00	0.00	0.00	0.24	0.22	0.66	0.19	0.10	0.11	0.20	0.25
42	2	ns	ns	0.58	ns	0.78	3.19	0.33	ns	0.00	0.00	0.00	0.00	0.15
43	2	ns	3.02	0.44	ns	0.00	ns	ns	0.61	0.12	0.35	ns	0.66	ns
44	2	0.60	0.00	ns	0.00	0.00	ns	ns	0.15	0.00	0.00	0.00	ns	0.15
45	2	0.17	0.00	0.00	0.00	0.00	0.18	0.41	0.00	0.00	0.15	0.00	0.12	0.15
46	2	2.09	0.46	0.62	1.53	0.70	1.21	0.83	ns	ns	0.89	0.59	0.41	0.43
47	2	ns	1.20	0.00	ns	ns	0.18	0.00	0.00	0.00	0.00	ns	0.00	0.00
48	2	5.90	0.00	0.00	0.00	0.00	0.23	ns	0.22	0.13	0.00	0.10	0.11	ns
	Mean	**1.78**	**0.67**	**0.23**	**0.31**	**0.21**	**0.87**	**0.36**	**0.27**	**0.06**	**0.19**	**0.13**	**0.21**	**0.19**
	Overall mean	**1.34**	**0.66**	**0.31**	**0.28**	**0.17**	**0.81**	**0.49**	**0.55**	**0.38**	**0.24**	**0.44**	**0.21**	0.29
Effective Rainfall (mm/wk)		40.6	13.4	17.32	4.55	23.89	16.95	30.55	16.76	33.55	12.15	20.07	46.40	11.48

Appendix 12…continued: Effect of treatment (Dirty water = 1; 2-Cut = 2; Grazed = 3; 1-Cut = 4) on NH_4-N concentrations (mg/l) for each cup and all treatments in the drainage year November 2003 to May 2004; Effective rainfall (mm/week) (Concentrations in red > MAC; ns = no sample).

Cup	Treatment	18/2/04	25/2/04	4/3/04	9/3/04	16/3/04	23/3/04	31/3/04	7/4/04	13/4/04	20/4/04	28/4/04	4/5/04	11/5/04
25	2	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
26	2	0.70	0.85	0.93	0.77	ns	0.92	ns	ns	ns	1.03	0.78	0.41	0.44
27	2	0.51	0.00	0.35	0.31	0.33	0.78	2.44	0.37	0.53	0.97	0.35	0.32	0.34
28	2	0.36	0.46	0.52	0.49	0.77	ns	ns	ns	ns	ns	ns	ns	ns
29	2	0.20	0.13	ns	ns	ns	0.57	ns	0.11	0.00	0.20	0.00	0.33	0.00
30	2	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
31	2	0.80	0.66	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
32	2	0.14	0.17	0.36	0.24	ns	0.82	ns	0.13	0.00	0.11	ns	ns	ns
	Mean	**0.45**	**0.38**	**0.54**	**0.45**	**0.55**	**0.77**	**2.44**	**0.20**	**0.18**	**0.58**	**0.38**	**0.35**	**0.26**
33	2	0.52	0.00	ns	ns	ns	ns	ns	0.00	ns	0.00	ns	0.00	ns
34	2	ns	ns	ns	ns	ns	ns	ns	0.34	ns	ns	ns	ns	ns
35	2	ns	ns	ns	ns	0.97	ns	ns	0.74	ns	ns	1.44	0.13	0.19
36	2	0.14	0.11	0.15	0.14	ns	ns	ns	1.06	0.00	ns	ns	0.00	0.00
37	2	0.66	0.00	0.24	0.00	0.00	0.00	0.16	0.00	0.00	0.11	0.00	0.00	0.00
38	2	0.51	0.50	0.53	0.50	ns	ns	ns	ns	ns	ns	ns	0.12	ns
39	2	0.44	0.29	0.31	0.27	0.49	ns	ns	0.63	0.34	1.78	0.46	0.33	0.20
40	2	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
	Mean	**0.45**	**0.18**	**0.31**	**0.23**	**0.49**	**0.00**	**0.16**	**0.46**	**0.11**	**0.63**	**0.63**	**0.10**	**0.10**
41	2	0.16	0.15	0.23	0.10	ns	0.27	ns	0.00	0.00	0.00	0.00	0.00	0.00
42	2	0.22	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	1.51	0.52
43	2	ns	ns	ns	ns	ns	ns	ns	0.72	0.71	ns	ns	ns	ns
44	2	0.00	0.11	ns	ns	ns	0.37	ns	ns	ns	ns	ns	0.13	ns
45	2	0.13	ns	0.30	0.00	0.00	0.21	0.31	0.12	0.14	0.16	ns	ns	ns
46	2	0.47	0.23	ns	0.47	ns	0.81	ns	ns	0.23	0.24	ns	ns	ns
47	2	0.00	0.00	1.00	0.00	ns	ns	ns	0.00	0.00	ns	ns	ns	ns
48	2	ns	ns	ns	1.94	ns	0.31	0.18	0.00	0.00	0.00	0.00	0.00	0.00
	Mean	**0.16**	**0.12**	**0.51**	**0.50**	**0.00**	**0.39**	**0.25**	**0.17**	**0.18**	**0.10**	**0.00**	**0.41**	**0.17**
	Overall mean	**0.35**	**0.23**	**0.45**	**0.39**	**0.35**	**0.39**	**0.95**	**0.28**	**0.16**	**0.44**	**0.34**	**0.29**	0.18
Effective Rainfall (mm/wk)		3.60	0.00	2.04	0.00	56.35	17.47	0.00	3.86	0.00	12.12	14.89	0.00	0.00

Appendix 12…continued: Effect of treatment (Dirty water = 1; 2-Cut = 2; Grazed = 3; 1-Cut = 4) on NH_4-N concentrations (mg/l) for each cup and all treatments in the drainage year November 2003 to May 2004; Effective rainfall (mm/week) (Concentrations in red > MAC; ns = no sample).

Cup	Treatment	19/11/03	26/11/03	3/12/03	10/12/03	17/12/03	23/12/03	30/12/03	7/1/04	14/1/04	21/1/04	28/1/04	4/2/04	11/2/04
49	3	0.15	0.00	0.00	ns	0.00	0.24	0.52	ns	0.47	0.00	0.37	ns	ns
50	3	2.72	0.00	0.00	0.20	0.00	0.28	0.24	ns	0.38	0.14	0.37	0.28	0.32
51	3	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
52	3	1.15	0.00	0.00	0.00	0.00	0.24	ns	ns	0.32	0.00	0.00	0.00	0.00
53	3	0.00	0.00	0.00	ns	0.00	0.62	ns	ns	0.23	0.00	0.00	ns	ns
54	3	1.04	0.00	0.00	0.00	0.00	ns	0.20	0.13	0.12	0.00	0.12	ns	0.25
55	3	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
56	3	7.00	0.63	0.69	ns	ns	ns	ns	2.25	0.26	0.56	0.42	0.14	0.00
	Mean	**2.01**	**0.11**	**0.12**	**0.07**	**0.00**	**0.35**	**0.32**	**1.19**	**0.30**	**0.12**	**0.21**	**0.14**	**0.14**
57	3	1.38	ns	ns	ns	ns	ns	ns	0.15	0.00	0.00	0.00	0.00	ns
58	3	2.09	0.10	0.00	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
59	3	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
60	3	0.70	0.00	0.00	0.00	0.00	0.18	ns	0.00	0.00	0.00	0.00	0.00	ns
61	3	0.27	0.00	0.00	0.00	0.00	0.16	0.00	ns	0.00	ns	0.00	0.00	0.13
62	3	0.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	ns	0.11
63	3	ns	ns	ns	1.10	0.00	ns	0.58	0.22	0.00	0.00	0.00	0.00	0.00
64	3	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
	Mean	**0.97**	**0.03**	**0.00**	**0.28**	**0.00**	**0.11**	**0.19**	**0.09**	**0.00**	**0.00**	**0.00**	**0.00**	**0.08**
65	3	0.84	0.00	0.00	0.00	0.00	ns	ns	0.19	0.00	0.00	0.00	0.00	0.00
66	3	ns	ns	1.22	ns	ns	ns	ns	ns	0.22	0.00	0.00	0.12	0.00
67	3	1.98	0.12	0.00	ns	ns	ns	ns	ns	ns	ns	ns	ns	0.57
68	3	0.28	ns	0.00	0.00	0.00	0.13	0.11	0.13	0.11	0.00	0.00	0.13	0.00
69	3	1.54	0.00	0.22	0.12	0.32	0.43	0.30	0.32	ns	0.13	0.25	0.18	0.15
70	3	0.54	0.00	0.00	0.00	0.00	ns	ns	0.12	0.00	0.21	0.00	0.00	ns
71	3	2.90	0.17	0.27	0.00	0.00	0.32	0.30	ns	0.31	0.16	0.26	0.17	0.17
72	3	1.26	0.11	0.00	0.00	0.00	0.00	0.00	ns	0.00	0.00	0.00	0.00	0.00
	Mean	**1.33**	**0.07**	**0.21**	**0.02**	**0.05**	**0.22**	**0.18**	**0.19**	**0.11**	**0.07**	**0.07**	**0.09**	**0.13**
	Overall mean	**1.44**	**0.07**	**0.11**	**0.12**	**0.02**	**0.23**	**0.23**	**0.49**	**0.13**	**0.06**	**0.10**	**0.08**	0.12
Effective Rainfall (mm/wk)		40.6	13.4	17.32	4.55	23.89	16.95	30.55	16.76	33.55	12.15	20.07	46.40	11.48

Appendix 12…continued: Effect of treatment (Dirty water = 1; 2-Cut = 2; Grazed = 3; 1-Cut = 4) on NH_4-N concentrations (mg/l) for each cup and all treatments in the drainage year November 2003 to May 2004; Effective rainfall (mm/week) (Concentrations in red > MAC; ns = no sample).

Cup	Treatment	18/2/04	25/2/04	4/3/04	9/3/04	16/3/04	23/3/04	31/3/04	7/4/04	13/4/04	20/4/04	28/4/04	4/5/04	11/5/04
49	3	ns	ns	ns	ns	ns	1.66	0.00	0.00	ns	ns	ns	ns	ns
50	3	0.55	0.34	0.39	ns	ns	1.16	0.30	0.36	0.79	0.81	0.35	0.26	0.74
51	3	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
52	3	0.00	0.00	ns	ns	ns	ns	0.00	0.00	ns	ns	ns	ns	ns
53	3	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
54	3	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
55	3	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
56	3	0.11	ns	ns	ns	ns	0.18	ns	0.00	0.00	0.00	0.00	0.00	0.00
	Mean	**0.22**	**0.17**	**0.39**	**ns**	**ns**	**1.00**	**0.10**	**0.09**	**0.40**	**0.41**	**0.18**	**0.13**	**0.37**
57	3	ns	ns	ns	ns	ns	0.33	0.00	0.11	ns	0.20	ns	ns	ns
58	3	ns	ns	ns	ns	ns	1.13	0.00	ns	ns	ns	ns	ns	ns
59	3	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
60	3	ns	ns	ns	ns	ns	0.11	0.00	0.00	0.00	ns	ns	ns	0.00
61	3	0.00	0.00	ns	ns	ns	0.00	0.00	0.00	ns	ns	ns	ns	ns
62	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
63	3	0.11	0.00	0.19	0.19	ns	0.33	0.00	0.00	0.00	0.00	0.00	ns	ns
64	3	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
	Mean	**0.04**	**0.00**	**0.10**	**0.10**	**0.00**	**0.32**	**0.00**	**0.02**	**0.00**	**0.07**	**0.00**	**0.00**	**0.00**
65	3	ns	ns	0.22	0.00	0.00	0.00	ns	0.00	0.00	0.00	0.00	ns	0.00
66	3	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
67	3	ns	ns	ns	ns	0.00	0.00	ns	0.00	0.00	0.00	0.00	0.00	0.00
68	3	0.00	0.00	0.00	0.00	0.00	0.00	ns	0.00	0.00	0.00	0.00	0.00	0.00
69	3	0.23	0.19	ns	ns	0.35	0.12	ns	0.13	0.00	0.20	0.00	0.00	0.00
70	3	ns	ns	ns	ns	0.21	0.00	ns	ns	ns	ns	ns	ns	ns
71	3	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
72	3	ns	ns	ns	ns	ns	0.18	ns	0.00	ns	0.00	ns	ns	ns
	Mean	**0.12**	**0.10**	**0.11**	**0.00**	**0.11**	**0.05**	**ns**	**0.03**	**0.00**	**0.04**	**0.00**	**0.00**	**0.00**
	Overall mean	**0.12**	**0.09**	**0.20**	**0.05**	**0.06**	**0.46**	**0.05**	**0.05**	**0.13**	**0.17**	**0.06**	**0.04**	0.12
Effective Rainfall (mm/wk)		3.60	0.00	2.04	0.00	56.35	17.47	0.00	3.86	0.00	12.12	14.89	0.00	0.00

Appendix 12…continued: Effect of treatment (Dirty water = 1; 2-Cut = 2; Grazed = 3; 1-Cut = 4) on NH_4-N concentrations (mg/l) for each cup and all treatments in the drainage year November 2003 to May 2004; Effective rainfall (mm/week) (Concentrations in red > MAC; ns = no sample).

Cup	Treatment	19/11/03	26/11/03	3/12/03	10/12/03	17/12/03	23/12/03	30/12/03	7/1/04	14/1/04	21/1/04	28/1/04	4/2/04	11/2/04
73	4	ns	0.32	0.00	0.00	0.00	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00
74	4	1.32	0.41	0.30	0.19	0.00	0.45	0.43	0.44	0.39	0.28	0.47	0.19	0.17
75	4	0.65	0.00	0.00	ns	ns	ns	ns	0.00	0.11	0.00	0.00	0.13	0.00
76	4	0.12	0.00	0.00	ns	0.00	0.13	0.00	ns	0.00	0.19	0.00	0.00	0.00
77	4	0.78	0.24	0.00	ns	ns	ns	ns	0.15	0.00	0.00	ns	0.00	ns
78	4	ns	ns	ns	ns	ns	ns	ns	0.73	0.26	0.00	ns	ns	0.18
79	4	2.70	0.00	0.00	0.00	0.00	0.13	0.14	0.10	0.16	0.00	0.12	ns	ns
80	4	0.57	0.00	0.00	0.00	0.00	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Mean	**1.02**	**0.14**	**0.04**	**0.05**	**0.00**	**0.20**	**0.11**	**0.20**	**0.12**	**0.06**	**0.10**	**0.05**	**0.06**
81	4	1.63	0.00	0.00	0.00	0.00	0.45	0.31	0.59	0.38	0.24	0.47	0.20	ns
82	4	0.63	0.00	0.00	0.00	0.00	0.12	ns	0.11	0.13	0.00	0.10	0.15	0.11
83	4	ns	2.71	0.00	ns	0.00	0.48	ns	0.48	0.34	0.36	ns	ns	1.31
84	4	ns	0.12	0.00	0.00	0.00	ns	ns	ns	0.00	0.00	ns	0.00	0.00
85	4	0.34	0.00	0.00	ns	0.00	ns	ns	0.38	0.18	0.19	0.00	0.26	0.15
86	4	4.94	0.00	0.11	ns	1.37	ns	ns	0.77	0.22	0.23	1.30	0.48	0.24
87	4	ns	ns	ns	ns	ns	ns	0.23	ns	0.47	0.00	0.00	0.00	0.00
88	4	2.19	0.00	0.00	0.00	0.00	0.25	ns	ns	0.00	0.00	0.00	0.00	0.00
	Mean	**1.95**	**0.40**	**0.02**	**0.00**	**0.20**	**0.33**	**0.27**	**0.47**	**0.22**	**0.13**	**0.31**	**0.16**	**0.26**
89	4	ns	ns	ns	ns	ns	ns	0.29	ns	1.18	0.24	ns	ns	ns
90	4	ns	0.51	ns	ns	ns	ns	ns	0.00	0.00	0.00	0.00	0.00	0.00
91	4	0.36	0.00	0.00	0.00	0.00	ns	0.25	0.13	0.14	0.00	0.13	ns	ns
92	4	0.50	0.00	0.17	0.00	0.00	0.24	0.22	ns	0.12	0.00	0.00	0.00	0.17
93	4	0.87	0.00	0.10	0.43	0.00	0.55	0.38	ns	0.88	0.43	1.63	0.33	0.21
94	4	0.69	0.11	0.18	0.00	0.00	0.47	0.28	0.10	0.00	0.31	ns	ns	0.24
95	4	ns	1.51	0.10	ns	ns	ns	1.58	0.77	0.48	0.40	0.97	0.51	0.60
96	4	0.57	0.00	0.00	0.00	0.00	0.25	0.17	0.18	0.13	0.11	0.15	0.17	0.13
	Mean	**0.60**	**0.30**	**0.09**	**0.09**	**0.00**	**0.38**	**0.45**	**0.24**	**0.37**	**0.19**	**0.48**	**0.20**	**0.23**
	Overall mean	**1.19**	**0.28**	**0.05**	**0.04**	**0.07**	**0.30**	**0.28**	**0.30**	**0.23**	**0.12**	**0.30**	**0.14**	0.18
Effective Rainfall (mm/wk)		40.6	13.4	17.32	4.55	23.89	16.95	30.55	16.76	33.55	12.15	20.07	46.40	11.48

Appendix 12…continued: Effect of treatment (Dirty water = 1; 2-Cut = 2; Grazed = 3; 1-Cut = 4) on NH_4-N concentrations (mg/l) for each cup and all treatments in the drainage year November 2003 to May 2004; Effective rainfall (mm/week) (Concentrations in red > MAC; ns = no sample).

Cup	Treatment	18/2/04	25/2/04	4/3/04	9/3/04	16/3/04	23/3/04	31/3/04	7/4/04	13/4/04	20/4/04	28/4/04	4/5/04	11/5/04
73	4	0.11	0.00	0.00	0.00	0.00	0.00	ns	0.00	0.00	0.00	0.00	0.00	0.11
74	4	0.18	0.12	0.00	0.00	ns	0.41	ns	0.00	0.00	0.24	0.11	ns	ns
75	4	0.13	ns	ns	ns	ns	ns	ns	0.14	0.00	ns	0.00	ns	ns
76	4	ns	ns	ns	ns	ns	0.10	ns	0.00	ns	ns	ns	ns	ns
77	4	ns	ns	ns	ns	ns	ns	0.33	ns	ns	ns	ns	ns	ns
78	4	ns	ns	ns	0.88	ns	ns	0.85	ns	ns	ns	ns	ns	ns
79	4	0.25	ns	0.48	ns	ns	0.22	0.24	0.24	0.00	0.00	0.00	0.00	0.00
80	4	0.13	0.00	ns	ns	ns	0.12	ns	0.11	0.00	0.00	0.00	ns	ns
	Mean	**0.16**	**0.04**	**0.16**	**0.29**	**0.00**	**0.17**	**0.47**	**0.08**	**0.00**	**0.06**	**0.02**	**0.00**	**0.06**
81	4	ns	ns	ns	ns	ns	0.53	ns	ns	ns	ns	ns	ns	ns
82	4	ns	ns	ns	ns	ns	0.30	ns	ns	0.19	0.00	ns	ns	0.12
83	4	ns	ns	ns	ns	ns	1.52	ns	ns	ns	ns	ns	ns	ns
84	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
85	4	ns	ns	ns	ns	ns	0.85	ns	0.49	0.00	ns	ns	0.31	ns
86	4	ns	ns	ns	ns	ns	2.81	ns	ns	ns	ns	0.87	ns	ns
87	4	ns	0.00	ns	ns	0.00	ns	ns	0.00	ns	ns	0.00	ns	ns
88	4	0.00	0.00	0.00	0.00	0.00	0.00	ns	0.00	0.00	0.00	ns	ns	0.00
	Mean	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.86**	**0.00**	**0.12**	**0.05**	**0.00**	**0.29**	**0.16**	**0.04**
89	4	0.24	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
90	4	0.00	ns	ns	0.32	0.16	0.00	0.24	0.00	0.00	0.00	0.00	0.15	0.00
91	4	ns	0.00	0.00	0.00	ns	0.00	0.16	0.00	0.00	0.00	0.00	0.00	0.00
92	4	0.00	0.00	ns	ns	ns	ns	ns	ns	0.00	0.00	0.00	0.00	0.00
93	4	ns	ns	ns	ns	ns	0.93	ns	0.49	0.18	ns	0.90	0.22	ns
94	4	ns	0.35	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
95	4	ns	ns	ns	ns	ns	ns	ns	0.29	0.00	ns	0.00	ns	ns
96	4	0.25	0.17	0.25	ns	ns	0.33	ns	0.00	0.00	0.00	0.00	0.00	0.00
	Mean	**0.12**	**0.13**	**0.13**	**0.16**	**0.16**	**0.32**	**0.20**	**0.16**	**0.03**	**0.00**	**0.15**	**0.08**	**0.00**
	Overall mean	**0.09**	**0.06**	**0.10**	**0.15**	**0.05**	**0.45**	**0.22**	**0.12**	**0.03**	**0.02**	**0.15**	**0.08**	0.03
Effective Rainfall (mm/wk)		3.60	0.00	2.04	0.00	56.35	17.47	0.00	3.86	0.00	12.12	14.89	0.00	0.00