Practical Worm Counts to Monitor Soil Health

Producers Conference Organic Research Centre January 2017

Tolhurst Organic Partnership CIC



The farm business

- Established organic 1976
- Present site 24 years stockfree
- Produce over 70 crops-100tonnes pa
- Self sufficient system
- Local sales



The trial

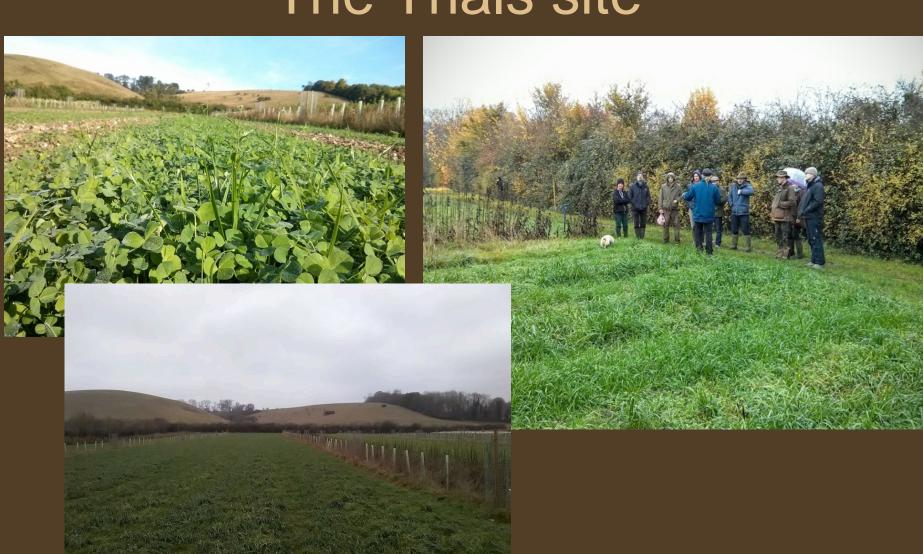
 Testing and comparing soil assessment for specific horticultural systems

Focus on:

- Soil organic matter
- Increased soil life
- NRM soil health test
- Visual assessment
- Earthworms



The Trials site



Trials site cropping



The field rotation



Year 1+2 Undersown long term GM



Year 3

O.winter green manure



Year7



O.W G M



O.W Gm



Year 5

Green manure: grazing rye/crimson red clover/yellow trefoil



First GM sown mid July, second sown early September

Trial layout

	edge	bed 6	bed 5	bed 4	bed 3	bed 2	bed 1	edge		early sowing	in mid	July
										late sowing in	early	Sept
										buffer row		
										agroforestry	tree ro	wc
150m												
									GN	/I mixture incl	ludes:	1
									cri	mson clover		
									re	d clover		
										llow trefoil		
									plι	is veg or rye		
V	<-1m->		<-1.5m->									
	<			12m				>				
				path								







Report No. 25531	Cropping:	Farm Details:	Client:	L703
Sample No. 312550 Sample Ref. TOL 1	No cropping details given	A VIEWEGER ORC ELM FARM RG20 0HR	RESEARCH DEPARTMEI ELM FARM RESEARCH (HAMSTEAD MARSHALL NEWBURY	
Date Received: 22/07/2016	Date Reported: 29/07/2016	SOIL	BERKSHIRE RG20 0HR	

Soil Chemical Analysis

	Index	Result	Low	Marginal	Target	Marginal	High
P	3	32.0 mg/l					D.FVDWV
K	2-	149 mg/l	APPROXIMATE HAVE NO	Name of the last o			
Mg	2	82.7 mg/l					
Organic Matter (LOI)		6.1%	Level data not availa	able for this crop			
			Very Acid	Acid	Neutral	Alkali	Very Alkali
Soil pH		6.6					

Where no future crop code has been given, levels are calculated assuming an arable crop. If general fertiliser and lime recommendations have been requested, these are given on the following sheets. The analytical methods used are as described in DEFRA Reference Book 427. The index values are determined from the DEFRA Fertiliser Recommendations RD209 8th Edition (Appendix 4).

Microbial Activity

	Index	Result	Very Low	Low	Moderat	e-Low Mo	oderate	High
CO ₂ Burst	5.0	> 162 mg/kg	Charles and a			NAME OF STREET	SHARKE WIT	and the property of
otential N Mineralisa	ation (kg/h	a/yr) - Based on	CO ₂ Burst					
Very Low (<15)		Low (15-25)	☐ Mo	derate-Low (25-4	15)	Moderate (45-75	5)	High (75-105)
Textural Classif	ication							
90	10		Heavy Soil	Brea	akdown:	Sand 56%	Silt 32%	Clay 12%
80/	1	8	Medium Soil	Soil	Textural	Sandy Loam	nomiavičA	J. Ohl
70	Clay	10	Light Soil		or Soil	Medium	nation/\fright entispei/	Scal Testone
1 60 1 50		No Parami all		Slop	oe:	00		
40 Sandy clay	XX	Silty &		THE RESERVE THE PARTY OF THE PA	iter Eros	ion Risk	Key	Sulf Crgatko morter
Sandy clay loam	Clay loam	Silty clay loam		ed > 7°			Very High	High
Sandy loam	Sandy sil		8	2-3			Mod	lerate er
Send Loamy send	1	1	13	-	Light	Medium He	eavy	

Soil Health Index - Based on soil chemical, physical and biological results.

8 8 6



NRM Coopers Bridge, Braziers Lane, Bracknell, Berkshire RG42 6NS Tel: +44 (0) 1344 886338 Fax: +44 (0) 1344 890972 Email: enquiries@nrm.uk.com www.nrm.uk.com

NRM Laboratories is a division of Cawood Scientific Ltd, Coopers Bridge, Braziers Lane, Bracknell, Berkshire RG42 6NS Registered Number: 05655711 PAAG.

Professional Agricultural Analysis Group





REPORT

Report No. 35386	Cropping:	Farm Details:	Client:	L703
Sample No. 322808 Sample Ref. TOLLY CONTROL	No cropping details given Field Area: .5 Ac	ORC HAMSTEAD MARSHALL ELM FARM RG20 0HR	RESEARCH DEPAF ELM FARM RESEAI HAMSTEAD MARSI NEWBURY BERKSHIRE	RCH CENTR
Date Received: 11/10/2016	Date Reported: 14/10/2016	SOIL	RG20 0HR	

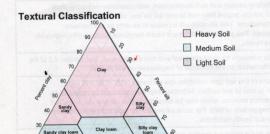
Soil Chemical Analysis

	Index	Result	Low	Marginal	Target	Marginal	High
P	2	25.2 mg/l					ar flav
K	1	93.5 mg/l					
Mg	2	80.8 mg/l		SHIP OF LINES AND A			
Organic Matter (LOI)		5.7%	Level data not availa	able for this crop			
			Very Acid	Acid	Neutral	Alkali	Very Alkali
Soil pH		6.8					

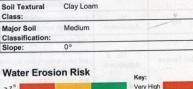
Where no future crop code has been given, levels are calculated assuming an arable crop. If general fertiliser and lime recommendations have been requested, these are given on the following sheets The analytical methods used are as described in DEFRA Reference Book 427. The index values are determined from the DEFRA Fertiliser Recommendations RD209 8th Edition (Appendix 4).

Microbial Activity

300,010 (Index	Result	Very Low	Low	Moderate-Low	Moderate	High
CO ₂ Burst	5.0	162 mg/kg	a distribution	a killing same	Shiphend state of		
Potential N Mineralisa	ation (kg/h	a/yr) - Based on	CO ₂ Burst				9
Very Low (<15)		Low (15-25)		Moderate-Low (25-45	Moderate	(45-75)	High (75-10



8 8



Silt 33%

Clay 19%



Sand 48%

Breakdown:

8 Soil Health Index - Based on soil chemical, physical and biological results.



NRM Coopers Bridge, Braziers Lane, Bracknell, Berkshire RG42 6NS

Tel: +44 (0) 1344 886338 Fax: +44 (0) 1344 890972 Email: enquiries@nrm.uk.com www.nrm.uk.com

NRM Laboratories is a division of Cawood Scientific Ltd, Coopers Bridge, Braziers Lane, Bracknell, Berkshire RG42 6NS Registered Number: 05655711

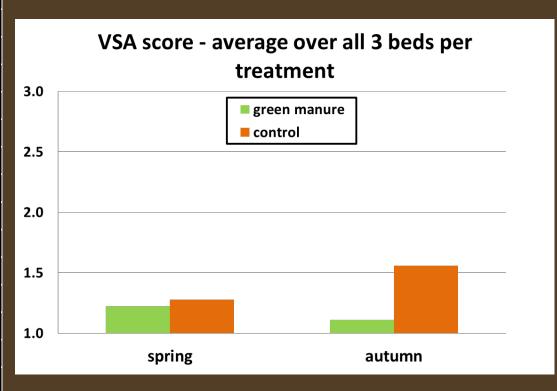
PAAG nal Agricultural Analysis Group

Soil Health Repor	t
-------------------	---

				l		1
	First Sampling	g - Spring 2016		Autun		
Location	To	olly				
Sample Ref.	TOL Cont.	TOL Green		TOL Cont.	TOL Green	
			AVERAGE			AVERAGE
Soil Chemical Analysis						
P (mg/l)	32	35.6	33.8	25.2	25.4	25.3
K (mg/l)	149	115	132	93.5	72.9	83.2
Mg (mg/l)	82.7	73.7	78.2	80.8	75.9	78.35
Organic Matter (LOI) (%)	6.10	6.20	6.15	5.7	5.8	5.75
Soil pH	6.6	7.2	6.9	6.8	7	6.9
Microbal Activity						
CO2 Burst (mg/kg)	> 162	134	134	162	155	158.5
Pot. N Mineralisation (kg/ha/yr)	75-105	75-105		75-105	75-105	
Textural Classification						
Sand (%)	56	52	54	48	53	50.5
Silt (%)	32	35	33.5	33	30	31.5
Clay (%)	12	13	12.5	19	17	18
Soil Textural Class	Sandy Loam	Sandy Loam		Clay Loam	Sandy Loam	
Major Soil Classification	Medium	Medium		Medium	Medium	
Soil Health Index	5	4.9	4.95	5	4.9	4.95

Visual Soil Assessment

Bed	Score spring	Score autumn
1a	1	1
1b	2	1
1c	1	1
2a	1	1
2b	1.5	1
2c	1	1
3a	1	1
3b	1	1
3c	1	1
4a	1	2
4b	2	2
4c	1	1
5a	1	1
5b	1.5	1
5c	1.5	2
6a	1	2
6b	2	2
6c	1	2

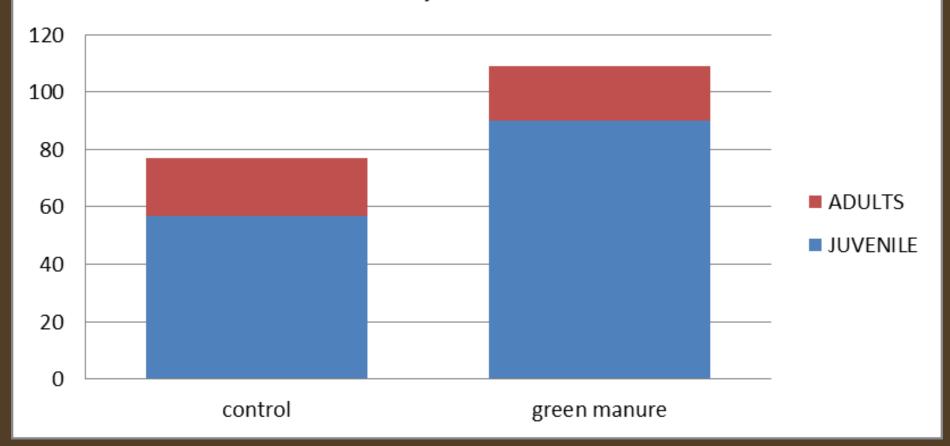


VSA Eblex-DairyCo method: 1=friable; 5=very compact

The earthworm populations



Total earthworm numbers per treatment Tolhurst, October 2016



Total earthworm numbers per bed

Tolhurst, October 2016

