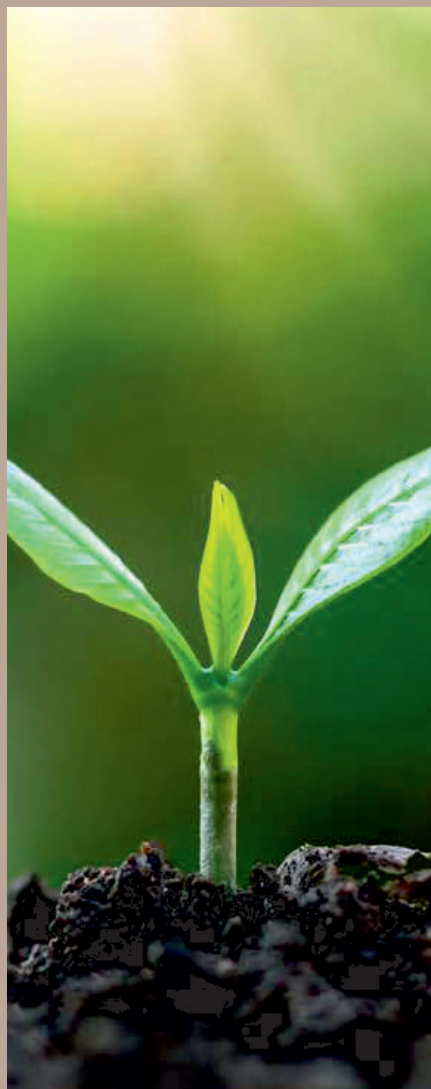
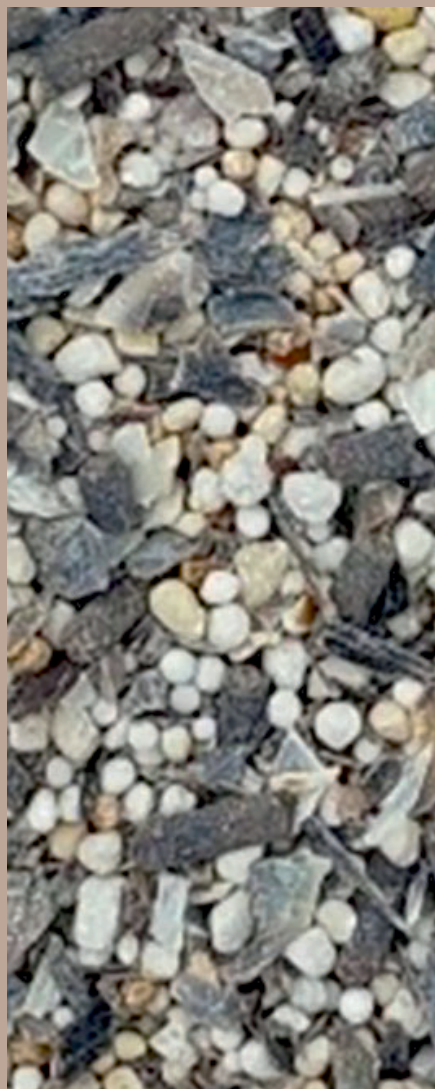




Interim report on the status of the project

Prague 2026

Fertilizers, Liming Materials and Inhibitors — Sampling and Sample Preparation — Sampling of Organic and Organo-mineral Fertilizers

Interim report on the status of the project

Content:

INTRODUCTION	2
TENDER CONDITIONS	3
PROJECT TIMEFRAME – TENDER MILESTONES.....	3
OVERVIEW	3
SAMPLING PROCEDURE.....	6
1. DYNAMIC METHOD.....	6
2. STATIC METHOD.....	6
NUMBER OF SAMPLES TAKEN/ANALYSED	6
QUALITY PARAMETERS	7
SAMPLING TOOLS.....	7
3. DYNAMIC SAMPLING.....	7
4. STATIC SAMPLING.....	7
5. DIVISION OF COMBINED SAMPLES.....	8
COURSE OF SAMPLING - ILLUSTRATION PHOTOS	9
ANALYSIS DATA.....	15
6. DYNAMIC SAMPLING – FINAL SAMPLES	15
7. STATIC SAMPLING - INCREMENTAL SAMPLES	15
8. RE-MIXING OF INCREMENTAL SAMPLES FROM STATIC SAMPLING - FINAL SAMPLES	18
STATISTICAL EVALUATION	19
9. DYNAMIC SAMPLING.....	19
9.1. <i>Dried pelleted manure – final samples</i>	19
(a) N, P, K	19
(b) C _{tot}	21
(c) Cd	22
(d) Cu	23
(e) Zn.....	24
9.2. <i>Blend 1 – final samples</i>	25
(a) N, P, K	25
(b) C _{tot}	26
(c) Cd	27
(d) Cu	28
(e) Zn.....	29
9.3. <i>Blend 2 – final samples</i>	30
(a) N, P, K	30
(b) C _{tot}	31

(c)	Cd	32
(d)	Cu	33
(e)	Zn.....	34
10.	STATIC SAMPLING – WHOLE CONE	35
10.1.	<i>Dried pelleted manure – incremental samples</i>	35
(a)	N, P, K	35
(b)	C _{tot}	36
(c)	Cd	37
(d)	Cu	38
(e)	Zn.....	39
10.2.	<i>Blend 1 – incremental samples</i>	40
(a)	N, P, K	40
(b)	C _{tot}	41
(c)	Cd	42
(d)	Cu	43
(e)	Zn.....	44
10.3.	<i>Blend 2 – incremental samples</i>	45
(a)	N, P, K	45
(b)	C _{tot}	46
(c)	Cd	47
(d)	Cu	48
(e)	Zn.....	49
11.	STATIC SAMPLING – LAYERS OF A CONE	50
11.1.	<i>Dried pelleted manure – incremental samples</i>	50
(a)	N, P, K	50
(b)	C _{tot}	52
(c)	Cd	53
(d)	Cu	54
(e)	Zn.....	55
11.2.	<i>Blend 1 – incremental samples</i>	56
(a)	N, P, K	56
(b)	C _{tot}	58
(c)	Cd	59
(d)	Cu	60
(e)	Zn.....	61
11.3.	<i>Blend 2 – incremental samples</i>	62
(a)	N, P, K	62
(b)	C _{tot}	64
(c)	Cd	65
(d)	Cu	66
(e)	Zn.....	67
CONCLUSION.....		68
RECOMMENDATION.....		68

Introduction

The new EU Regulation on fertilizing products (2019/1009) was approved in June 2019 and it applies from July 2022. Scope of the regulation covers also organic + organo-mineral fertilizers. The concept of the regulation is based on new legislative framework. Products have to get CE mark via conformity assessment procedure before they can be placed on the European market – whereas conformity with set of European standards (ENs) is assessed. One of the necessary standards concerns sampling of

organic (organo-mineral) fertilizers. Samples have to be taken representative of the whole lot of the product either at seller's or buyer's premises. The European Commission has requested CEN to ensure that a suitable, robust and provable sampling method is available within EN standards. Consequently, CEN has requested TC 260 WG1 to undertake this task. For this reason, TC 260 WG1 organised call for tender and Jaroslav Houček was appointed the project leader of EN 1482-5 (Sampling of Organic and Organo-mineral Fertilizers) in autumn 2023.

Tender conditions

- 1) Organic and organo-mineral materials in a static heap should be tested by comparing the method in EN 1482-3 with the in-motion method in EN 1482-1 to make a recommendation whether current methods can be applied. It might be possible that a new part 5 of the EN 1482 series has to be developed.
- 2) Three materials shall be tested: one single ingredient organic material + two blends of different compositions and different ingredients (e.g., one pelleted and one non pelleted).
- 3) Tenders should indicate the quantity of the materials to be subject to test and the parameters the samples will be tested for.
- 4) The products could be moved by conveyor belt to produce a static heap samples being taken from or at the end the conveyor and then from the heap built up.

Project timeframe – tender milestones

Approval of work programme, protocol and draft sampling method by CEN/TC 260/WG 1	1 January 2024
Step 2: Circulation of 1st Working Draft (stage 20.60)	1 August 2024
Step 3: Interim report on the status of the project	1 July 2025
Step 4: prEN Enquiry Draft (stage code 30.99)	1 January 2026
Step 5: FprEN Formal Vote Draft (stage code 45.99)	1 January 2027
Step 6: Final report	1 July 2027

Overview

There is current EN 1482: part 1 – sampling of fertilizers and liming materials; part 2 – sample preparation; part 3 – sampling of static heaps. It was developed for purposes of sampling of mineral fertilizers and liming materials. Nonetheless, some principles/methods of this EN can be applied also for sampling of organic and organo-mineral fertilizers. Generally SPEAKING, there are 4 basic groups/scenarios of fertilizers (incl. organic + organo-mineral) – bulk or packaged fertilizers, solid or liquid matrix. Project leader proposed and experts of CEN TC 260 WG 1 agreed that existing methods (defined in EN 1482-1, dynamic sampling) can be reliably used for solid and liquid packaged organic + organo-mineral fertilizers, as well as for bulk liquid organic + organo-mineral fertilizers. The only group of products which will have to be verified (for sampling from static heaps) are solid bulk organic and organo-mineral fertilizers.

Experts of CEN TC 260 WG 1 in cooperation with experts of WG 8 monitored the market to identify any potential products that may be traded as CE fertilizing products – meaning they meet declarations and specifications that the Regulation requires. The conclusion was that:

- a) Plant-based matrices are very unlikely to have sufficient nutrient levels to be organic + organo-mineral fertilizers
- b) Soil improvers are normally mixed with inorganic fertilizers at farm level

Project leader Jaroslav Houček proposed work programme, protocol and draft test method for the project related to the sampling of organic and organo-mineral fertilizers. This was approved by CEN TC 260 WG 1. It was decided that following three materials would be selected for experimental testing:

Dried pelleted manure (Photo 1)

Declaration: NPK 2,5 - 3 – 5

Composition: cattle manure – 100 %



Photo 1 - Dried pelleted manure

Blend 1 (Photo 2)

Declaration: NPK (MgO) 9-9-9 (3)

Composition: Patentkali – 31 %; Horn - 25 %; MAP – 19%; Pelleted poultry manure – 15 %; Ammonium nitrate – 10 %



Photo 2 - Blend 1

Blend 2 (Photo 3)

Declaration: NPK 12,3 - 6,1 - 9,2 (2,6)

Composition: Patentkali – 31 %; Horn - 29 %; Ammonium nitrate – 22 %; MAP – 13%; Organic fertilizer – 5 %



Photo 3 - Blend 2

Note: European Commission adopted (via delegated act) adding processed manure in CMC 10 within Regulation on fertilizing products No. 2019/1009. External contactor was selected to perform a study to support the inclusion of other animal by-products in CMC 10 – this study is still ongoing and is foreseen to be finished in 2025. Then European Commission will adopt adding those materials (via delegated act) in CMC 10 as well.

Sampling procedure

Two ways of sampling at three selected products were carried out - dynamic sampling and sampling from static heap. Then the ways of sampling were compared. The final sample from dynamic sampling was considered reference sample. There were two series of samples taken by two officers. Experimental testing took place at a Czech manufacturer's premises in July 2024.

1. Dynamic method

The predetermined quantity of fertilizer (24 t for dried pelleted manure; 12 t for blends) was moved from big bags to free area by a conveyor belt. The amount of fertilizer corresponded to the static sampling method. Moving of tested fertilizers constituted a cone. During the transfer, three series of incremental samples of selected fertilizers were taken at random intervals with sampling shovel. Combined samples were collected from every series of incremental samples. Then combined samples were divided to get three final samples - those were analyzed in a laboratory.

2. Static method

The number of sampling units and the sampling method were predefined for each heap. The conical heap was divided horizontally into virtual three layers/parts (the same height). Incremental samples were taken from all three virtual layers/parts – by double-tube spear. Number of incremental samples: 10 (lower layer), 6 (middle layer), 4 (upper layer). A series of samples from static sampling were analyzed – both all incremental samples taken from single layers and in addition final samples obtained from re-mixing of those incremental samples. This provided enough information for statistical evaluation.

Number of samples taken/analysed

Way of sampling		Material		
		Dried pelleted manure	Blend 1	Blend 2
Dynamic sampling – final samples		3	3	3
Static sampling of fertilizer from the heap - incremental samples	total samples	20	20	20
	of which lower layer	10	10	10
	of which middle layer	6	6	6
	of which upper layer	4	4	4
Re-mixing of incremental samples from static sampling - final samples		1	1	1
Total number of samples (1 officer)		72		
Total number of samples (2 officers)		2 x 72 = 144		

Quality parameters

All samples were analyzed for the following parameters: total nitrogen, total phosphorus, total potassium, total carbon^{*)}, Cd, Cu, Zn. Single ingredients differ significantly regarding content of above mentioned parameters, so their analyses provided enough information about composition of single samples in all three layers. Thus selected parameters indicated separation effect of ingredients (particles of different size and shape).

^{*)} there is no source of inorganic carbon in any of 3 materials tested, therefore total carbon = organic carbon

Sampling tools

3. Dynamic sampling

Sampling shovel (Photo 4)

Dimensions: length – 100 mm; width – 70 mm; height - 40 mm



Photo 4 - Sampling shovel

4. Static sampling

Double-tube spear (Photo 5)

Dimensions: length – 1 200 mm; diameter – 35 mm

Openings: 8; 85 x 20 mm

Range of filling: 950 mm



Photo 5 - Double-tube spear

5. Division of combined samples

Riffle divider (Photo 6)

Openings: 16; 20 mm



Photo 6 - Riffle divider

Course of sampling - illustration photos



Photo 1 – Fertilizer in big bags ready for testing



Photo 2 – Preparation for determination of sampling units



Photo 3 – Forklift transporting fertilizer over a conveyor belt



Photo 4 – Dynamic sampling from a conveyor belt



Photo 5 – Constituion of a cone (dried pelleted manure)



Photo 6 – Constituion of a cone (blend 1)



Photo 7 – Reduction & preparation of final samples (dynamic sampling)



Photo 8 – Determination of sampling units (static sampling)



Photo 9 – Sampling from upper layer (static sampling)



Photo 10 – Sampling from middle layer (static sampling)



Photo 11 – Sampling from lower layer (static sampling)

Analysis data

6. Dynamic sampling – final samples

N _{tot} /DM	P ₂ O ₅ tot/DM	K ₂ O _{tot} /DM	C _{tot} /DM	Cd _{tot} /DM	Cu _{tot} /DM	Zn _{tot} /DM	Material	Sampler
%				mg/kg				
2,56	3,02	5,51	42,40	0,199	52,63	287,7	DPM	PERSON A
2,52	2,98	5,45	42,31	0,197	51,57	286,6	DPM	PERSON A
2,55	3,02	5,55	42,31	0,194	51,99	288,8	DPM	PERSON A
10,01	8,89	10,61	22,08	2,16	28,34	146,9	BLEND 1	PERSON A
10,17	8,24	10,31	22,93	1,996	25,85	143,8	BLEND 1	PERSON A
10,61	8,49	10,45	20,47	2,121	21,46	121,3	BLEND 1	PERSON A
14,71	4,09	10,86	15,50	0,994	7,261	55,74	BLEND 2	PERSON A
14,32	4,47	11,45	14,95	1,101	7,882	56,17	BLEND 2	PERSON A
13,91	4,73	11,90	15,20	1,126	8,285	54,71	BLEND 2	PERSON A
2,66	3,06	5,53	42,96	0,210	53,18	296,6	DPM	PERSON B
2,60	3,01	5,51	43,71	0,194	51,58	286,7	DPM	PERSON B
2,60	3,12	5,60	42,04	0,209	53,62	302,6	DPM	PERSON B
9,62	9,56	11,51	17,56	2,324	18,36	106,8	BLEND 1	PERSON B
9,79	9,41	11,52	16,96	2,229	19,32	109,2	BLEND 1	PERSON B
9,33	8,44	12,13	19,03	1,968	21,64	120	BLEND 1	PERSON B
13,26	4,56	11,19	17,83	1,077	7,98	62,47	BLEND 2	PERSON B
13,50	4,37	11,21	17,54	0,9996	7,503	60,36	BLEND 2	PERSON B
13,39	6,38	10,79	16,79	1,54	8,409	58,13	BLEND 2	PERSON B

Note: DPM – dried pelleted manure

7. Static sampling - incremental samples

N _{tot} /DM	P ₂ O ₅ tot/DM	K ₂ O _{tot} /DM	C _{tot} /DM	Cd _{tot} /DM	Cu _{tot} /DM	Zn _{tot} /DM	Material	Sampler
%				mg/kg				
2,50	2,96	5,37	42,74	0,185	51,68	277,7	DPM	PERSON A
2,56	2,95	5,51	42,27	0,199	51,49	283,9	DPM	PERSON A
2,56	2,94	5,41	42,05	0,192	50,78	277,8	DPM	PERSON A
2,51	2,89	5,35	42,30	0,193	50,80	278,2	DPM	PERSON A
2,53	2,96	5,41	42,31	0,189	51,08	281,4	DPM	PERSON A
2,55	2,96	5,27	42,44	0,176	51,13	275,6	DPM	PERSON A
2,57	2,99	5,24	42,49	0,200	52,56	280,3	DPM	PERSON A
2,53	3,01	5,29	43,35	0,193	52,33	280,8	DPM	PERSON A
2,52	3,05	5,34	42,60	0,182	52,75	288,6	DPM	PERSON A
2,53	2,97	5,22	43,14	0,200	51,30	282,0	DPM	PERSON A
2,57	3,03	5,44	42,80	0,202	52,59	286,7	DPM	PERSON A
2,58	2,99	5,37	43,36	0,197	51,37	284,4	DPM	PERSON A
2,56	2,96	5,35	42,76	0,190	50,46	280,4	DPM	PERSON A
2,57	2,99	5,40	42,28	0,194	51,36	283,1	DPM	PERSON A

2,57	3,01	5,30	42,86	0,185	51,77	282,7	DPM	PERSON A
2,58	3,00	5,39	43,66	0,194	51,86	287,7	DPM	PERSON A
2,57	2,95	5,32	43,27	0,185	50,92	283,7	DPM	PERSON A
2,56	2,97	5,27	42,34	0,201	50,88	284,0	DPM	PERSON A
2,60	3,04	5,54	42,79	0,186	51,80	293,5	DPM	PERSON A
2,50	2,93	5,43	43,16	0,196	51,27	287,5	DPM	PERSON A
9,09	12,45	12,89	13,64	3,057	15,58	89,76	BLEND 1	PERSON A
8,81	11,97	13,68	13,03	3,057	18,55	83,36	BLEND 1	PERSON A
8,43	8,11	11,44	19,08	1,919	26,29	146,1	BLEND 1	PERSON A
8,31	9,63	12,44	16,24	2,284	20,15	116,3	BLEND 1	PERSON A
8,50	11,56	12,59	16,22	2,804	21,47	119,1	BLEND 1	PERSON A
9,07	8,88	12,50	16,84	2,074	19,92	112,8	BLEND 1	PERSON A
7,79	10,34	14,06	13,56	2,478	18,71	94,48	BLEND 1	PERSON A
8,72	12,11	14,61	11,32	2,96	12,37	68,35	BLEND 1	PERSON A
8,39	10,79	14,50	11,87	2,64	15,24	80,13	BLEND 1	PERSON A
9,86	9,48	12,15	17,87	2,312	19,34	105	BLEND 1	PERSON A
10,84	11,37	11,72	13,67	2,811	13,29	76,29	BLEND 1	PERSON A
10,79	9,32	11,86	15,28	2,28	14,78	86,71	BLEND 1	PERSON A
11,90	9,86	11,18	16,70	2,419	12,64	75,15	BLEND 1	PERSON A
10,49	11,04	11,03	15,31	2,704	14,73	89,73	BLEND 1	PERSON A
10,57	11,58	11,30	13,16	2,839	15,99	83,94	BLEND 1	PERSON A
10,74	11,82	12,11	10,95	2,884	11,21	60,6	BLEND 1	PERSON A
11,54	10,22	11,17	12,45	2,455	10,77	64,82	BLEND 1	PERSON A
12,37	7,11	10,82	11,93	1,751	8,931	57,9	BLEND 1	PERSON A
15,28	7,51	7,98	12,99	1,871	11,38	67,01	BLEND 1	PERSON A
15,66	5,50	7,26	11,02	1,361	9,047	55,5	BLEND 1	PERSON A
12,72	5,60	13,09	14,31	1,318	7,058	51,21	BLEND 2	PERSON A
12,15	6,05	13,66	13,32	1,442	7,716	54,24	BLEND 2	PERSON A
11,48	7,10	14,24	13,33	1,666	7,607	50,44	BLEND 2	PERSON A
12,48	5,58	13,42	15,68	1,373	7,827	57,77	BLEND 2	PERSON A
13,54	6,66	13,01	12,26	1,635	7,488	49,88	BLEND 2	PERSON A
12,69	4,93	13,91	12,13	1,203	7,778	50,41	BLEND 2	PERSON A
14,05	3,58	13,83	11,96	0,8518	7,174	46,47	BLEND 2	PERSON A
15,48	3,75	11,89	12,31	0,8981	6,815	49,64	BLEND 2	PERSON A
16,75	3,29	10,32	15,35	0,7882	7,29	53,42	BLEND 2	PERSON A
13,82	4,59	12,89	12,99	1,096	7,643	49,97	BLEND 2	PERSON A
14,67	4,03	12,43	12,55	0,9731	8,245	48,48	BLEND 2	PERSON A
16,37	4,46	9,29	13,18	1,09	8,126	51,1	BLEND 2	PERSON A
15,80	3,60	11,21	12,80	0,8884	7,499	49,91	BLEND 2	PERSON A
16,52	3,68	10,21	13,36	0,9012	7,159	49,61	BLEND 2	PERSON A
16,14	2,49	7,05	16,37	0,5283	7,911	57,75	BLEND 2	PERSON A
14,82	4,27	10,11	16,29	0,9879	8,192	57,14	BLEND 2	PERSON A
15,90	3,30	8,26	13,04	0,7913	8,021	51,33	BLEND 2	PERSON A
15,21	2,61	6,90	17,28	0,5905	8,408	63,86	BLEND 2	PERSON A
15,94	3,15	9,51	12,75	0,7283	8,361	50,94	BLEND 2	PERSON A
15,51	3,84	9,16	13,81	0,9393	7,845	49,99	BLEND 2	PERSON A

2,62	3,02	5,38	42,56	0,188	52,43	285,6	DPM	PERSON B
2,58	3,09	5,47	43,52	0,188	52,51	292,0	DPM	PERSON B
2,56	3,03	5,32	42,63	0,195	52,12	288,2	DPM	PERSON B
2,59	3,00	5,33	41,84	0,195	51,91	291,3	DPM	PERSON B
2,56	2,94	5,31	42,93	0,188	50,91	277,7	DPM	PERSON B
2,62	3,00	5,40	43,49	0,189	51,98	284,1	DPM	PERSON B
2,58	3,11	5,35	42,49	0,207	53,22	292,1	DPM	PERSON B
2,64	3,02	5,31	43,35	0,191	52,71	283,2	DPM	PERSON B
2,54	3,04	5,25	42,98	0,184	52,78	284,6	DPM	PERSON B
2,56	2,96	5,25	43,93	0,188	52,57	281,7	DPM	PERSON B
2,57	2,99	5,28	42,96	0,186	52,42	291,7	DPM	PERSON B
2,53	2,97	5,32	42,65	0,190	51,52	281,8	DPM	PERSON B
2,56	2,95	5,39	42,69	0,211	51,00	282,9	DPM	PERSON B
2,56	3,02	5,32	42,58	0,178	51,78	282,4	DPM	PERSON B
2,62	3,05	5,45	44,03	0,192	52,13	287,2	DPM	PERSON B
2,58	3,00	5,45	42,87	0,185	51,58	287,2	DPM	PERSON B
2,63	2,97	5,52	42,35	0,177	50,73	287,1	DPM	PERSON B
2,60	2,92	5,48	42,37	0,180	50,09	281,6	DPM	PERSON B
2,59	2,93	5,39	42,75	0,201	51,01	281,5	DPM	PERSON B
2,59	2,87	5,41	42,38	0,190	50,50	286,0	DPM	PERSON B
8,67	13,12	14,42	11,71	3,19	11,6	65,94	BLEND 1	PERSON B
9,40	11,50	10,74	18,46	2,713	22,02	122,3	BLEND 1	PERSON B
9,68	9,22	10,54	19,41	2,125	25,12	140,9	BLEND 1	PERSON B
8,52	10,90	11,33	18,39	2,516	25,29	140,9	BLEND 1	PERSON B
8,48	11,12	11,90	18,12	2,646	23,06	131,8	BLEND 1	PERSON B
8,46	9,28	13,06	15,02	2,222	21,33	113,1	BLEND 1	PERSON B
9,77	11,20	14,27	11,84	2,821	11,77	66,36	BLEND 1	PERSON B
9,86	12,83	13,55	11,86	3,116	14,6	77,2	BLEND 1	PERSON B
8,92	10,29	12,02	16,15	2,479	21,52	117,6	BLEND 1	PERSON B
9,52	10,20	11,76	18,36	2,445	20,37	113,9	BLEND 1	PERSON B
11,43	10,86	10,83	14,58	2,644	14,83	86,02	BLEND 1	PERSON B
10,01	9,97	11,71	15,29	2,409	19,75	106,4	BLEND 1	PERSON B
10,70	10,05	10,20	19,07	2,414	20,74	123,7	BLEND 1	PERSON B
10,80	10,82	11,51	18,04	2,479	17,56	102	BLEND 1	PERSON B
10,45	13,08	13,47	11,92	3,092	18,25	67,48	BLEND 1	PERSON B
10,81	11,19	13,30	11,22	2,64	13,33	60	BLEND 1	PERSON B
14,38	8,88	9,98	13,36	2,088	14,09	83,44	BLEND 1	PERSON B
15,61	7,65	9,29	12,07	1,791	9,629	61,37	BLEND 1	PERSON B
18,32	7,06	7,14	11,38	1,688	8,651	54,43	BLEND 1	PERSON B
17,24	7,50	8,27	10,65	1,839	7,83	119,9	BLEND 1	PERSON B
12,61	5,35	13,32	13,76	1,245	6,779	47,97	BLEND 2	PERSON B
11,68	6,70	13,59	13,57	1,609	7,753	52,48	BLEND 2	PERSON B
12,97	6,45	12,84	12,60	1,533	7,283	47,57	BLEND 2	PERSON B
12,82	5,48	13,14	12,78	1,277	7,171	49,14	BLEND 2	PERSON B
14,99	4,19	11,98	12,19	0,9889	6,261	44,57	BLEND 2	PERSON B
14,29	5,03	12,32	11,72	1,183	6,894	44,46	BLEND 2	PERSON B

15,22	3,06	12,40	12,47	0,6976	6,307	44,58	BLEND 2	PERSON B
13,81	3,28	12,73	14,36	0,7651	6,724	51,24	BLEND 2	PERSON B
17,20	2,94	10,02	14,27	0,6429	6,625	50,51	BLEND 2	PERSON B
16,61	2,93	10,68	12,83	0,7074	6,109	46,45	BLEND 2	PERSON B
14,43	4,47	11,72	14,77	1,053	7,448	55,02	BLEND 2	PERSON B
15,75	4,70	9,73	14,80	1,107	7,257	52,95	BLEND 2	PERSON B
15,61	3,79	11,63	11,94	0,8555	6,816	45,88	BLEND 2	PERSON B
15,84	4,06	10,54	14,88	0,9394	7,76	56,74	BLEND 2	PERSON B
15,44	3,32	9,05	14,05	0,7849	7,409	56,46	BLEND 2	PERSON B
15,22	4,20	10,45	14,69	1,018	7,8	57,38	BLEND 2	PERSON B
15,92	3,32	7,73	13,53	0,7729	7,79	51,18	BLEND 2	PERSON B
15,06	3,14	8,37	14,47	0,7237	7,977	52,58	BLEND 2	PERSON B
16,54	3,32	8,84	12,25	0,8148	7,527	47,45	BLEND 2	PERSON B
15,63	3,84	8,93	14,23	0,889	8,429	55,01	BLEND 2	PERSON B

Note: DPM – dried pelleted manure

8. Re-mixing of incremental samples from static sampling - final samples

N _{tot} /DM	P ₂ O ₅ tot/DM	K ₂ O _{tot} /DM	C _{tot} /DM	Cd _{tot} /DM	Cu _{tot} /DM	Zn _{tot} /DM	Material	Sampler
%				mg/kg				
2,56	3,00	5,43	42,74	0,188	51,98	284,6	DPM	PERSON A
11,26	9,73	10,85	12,80	2,322	13,24	74,71	BLEND 1	PERSON A
15,33	3,68	10,62	13,32	0,8459	7,489	49,92	BLEND 2	PERSON A
2,57	2,93	5,25	42,71	0,183	50,32	276,8	DPM	PERSON B
11,92	9,67	12,68	12,75	2,332	14,14	78,01	BLEND 1	PERSON B
15,14	3,84	10,66	12,97	0,9184	6,89	47,95	BLEND 2	PERSON B

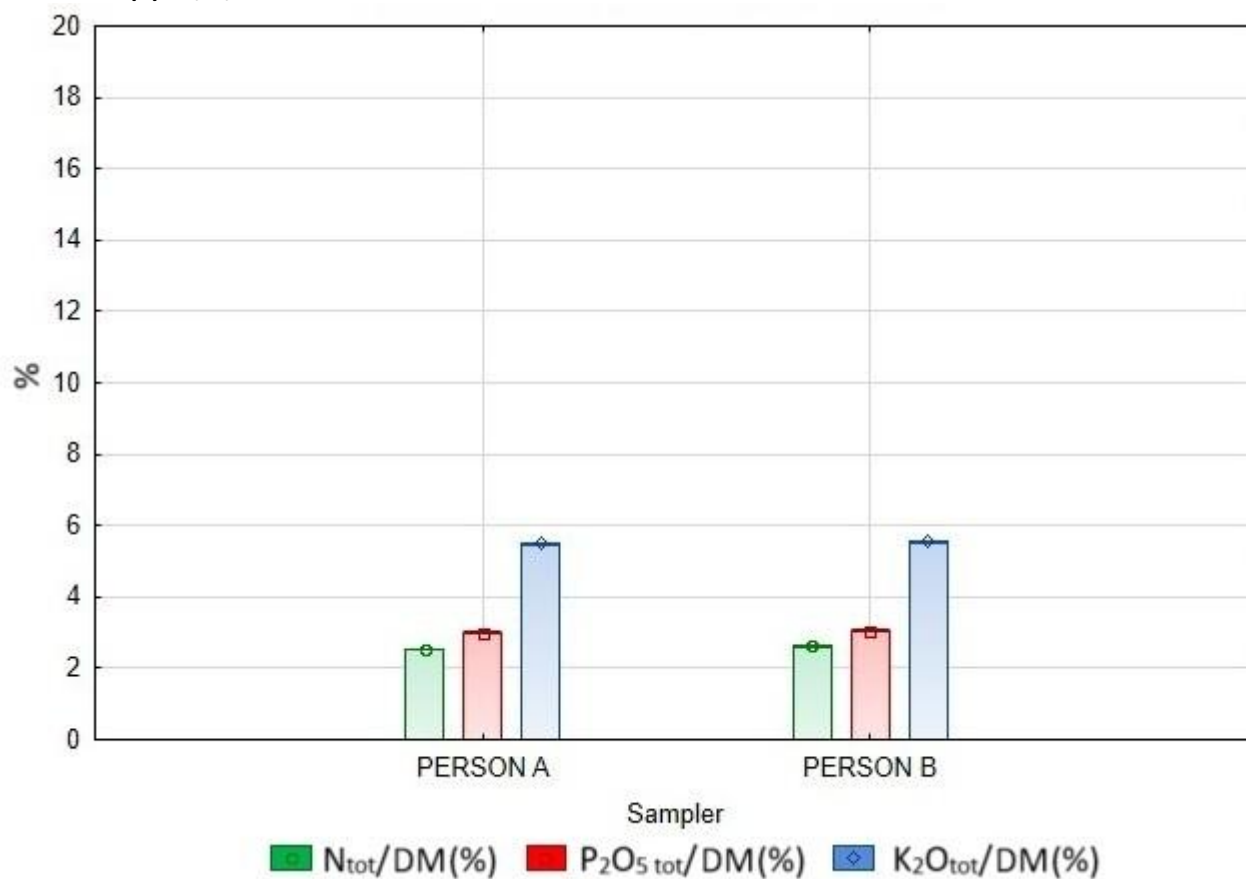
Note: DPM – dried pelleted manure

Statistical evaluation

9. Dynamic sampling

9.1. Dried pelleted manure – final samples

(a) N, P, K



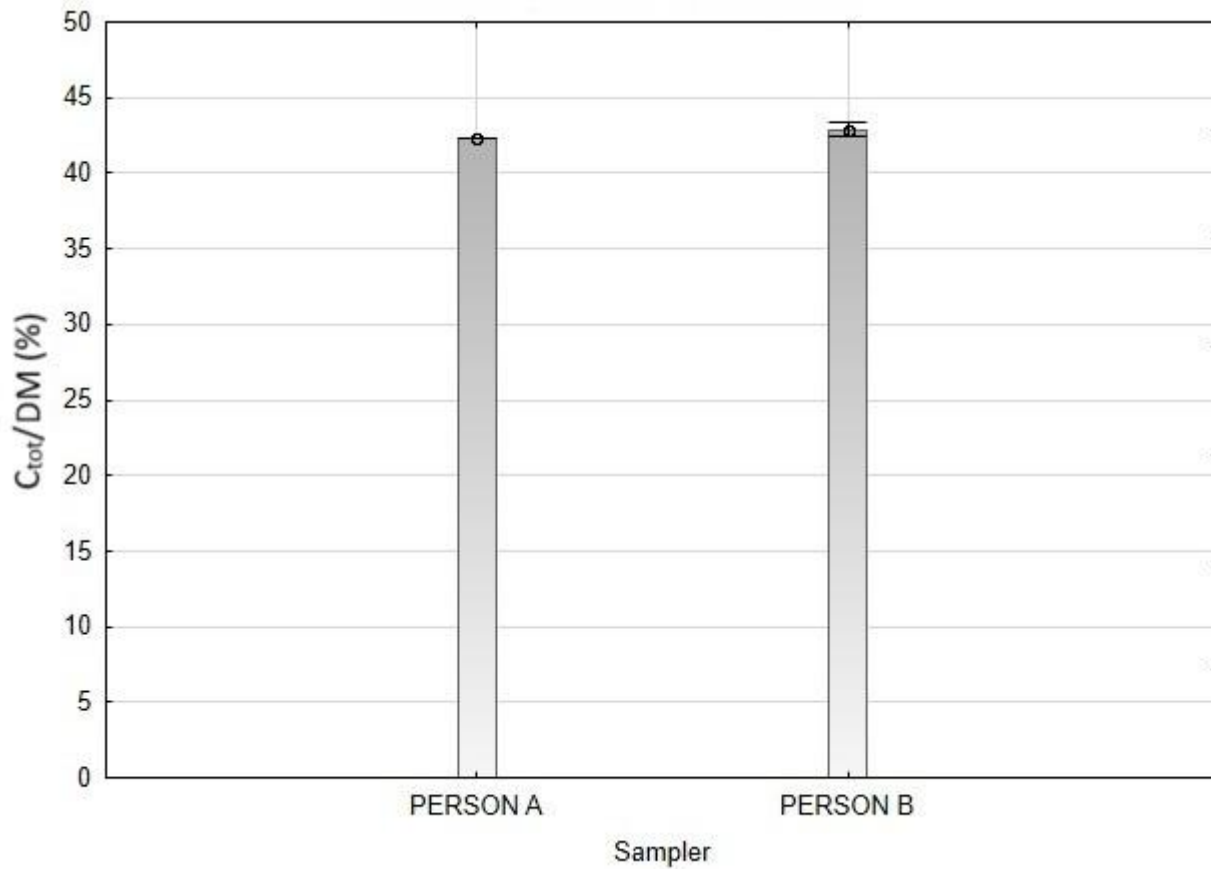
Sampler	N _{tot} /DM (%) (weighted average)	N _{tot} /DM (%) (SEM)	N _{tot} /DM (%) (-SEM)	N _{tot} /DM (%) (+SEM)	N
PERSON A	2,543333	0,012019	2,531315	2,555352	3
PERSON B	2,620000	0,020000	2,600000	2,640000	3
	P ₂ O ₅ tot/DM (%) (weighted average)	P ₂ O ₅ tot/DM (%) (SEM)	P ₂ O ₅ tot/DM (%) (-SEM)	P ₂ O ₅ tot/DM (%) (+SEM)	N
PERSON A	3,006667	0,013333	2,993333	3,020000	3
PERSON B	3,063333	0,031798	3,031535	3,095131	3
	K ₂ O _{tot} /DM (%) (weighted average)	K ₂ O _{tot} /DM (%) (SEM)	K ₂ O _{tot} /DM (%) (-SEM)	K ₂ O _{tot} /DM (%) (+SEM)	N
PERSON A	5,503333	0,029059	5,474274	5,532393	3
PERSON B	5,546667	0,027285	5,519382	5,573951	3

Note: SEM – Standard Error of the Mean

Tukey's Honest Significant Difference (HSD) test

Sampler	N_{tot}/DM (%) (weighted average)	1	2
PERSON A	2,543333	****	
PERSON B	2,620000		****
Sampler	P₂O_{5 tot}/DM (%) (weighted average)	1	2
PERSON A	3,006667	****	
PERSON B	3,063333	****	
Sampler	K₂O_{tot}/DM (%) (weighted average)	1	2
PERSON A	5,503333	****	
PERSON B	5,546667	****	

(b) C_{tot}



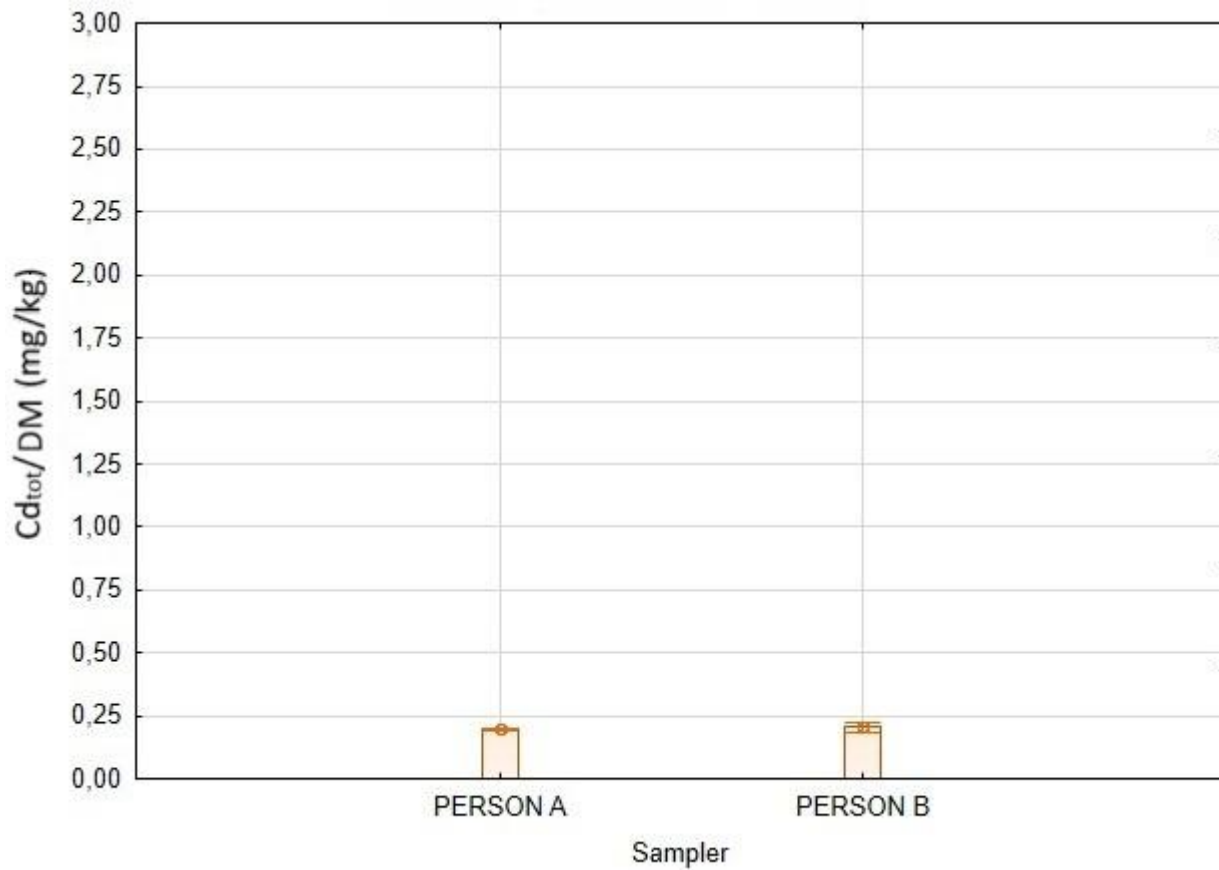
Sampler	C_{tot}/DM (%) (weighted average)	C_{tot}/DM (%) (SEM)	C_{tot}/DM (%) (-SEM)	C_{tot}/DM (%) (+SEM)	N
PERSON A	42,34000	0,030000	42,31000	42,37000	3
PERSON B	42,90333	0,482919	42,42041	43,38625	3

Note: SEM – Standard Error of the Mean

Tukey's Honest Significant Difference (HSD) test

Sampler	C_{tot}/DM (%) (weighted average)	1	2
PERSON A	42,34000	****	
PERSON B	42,90333	****	

(c) Cd



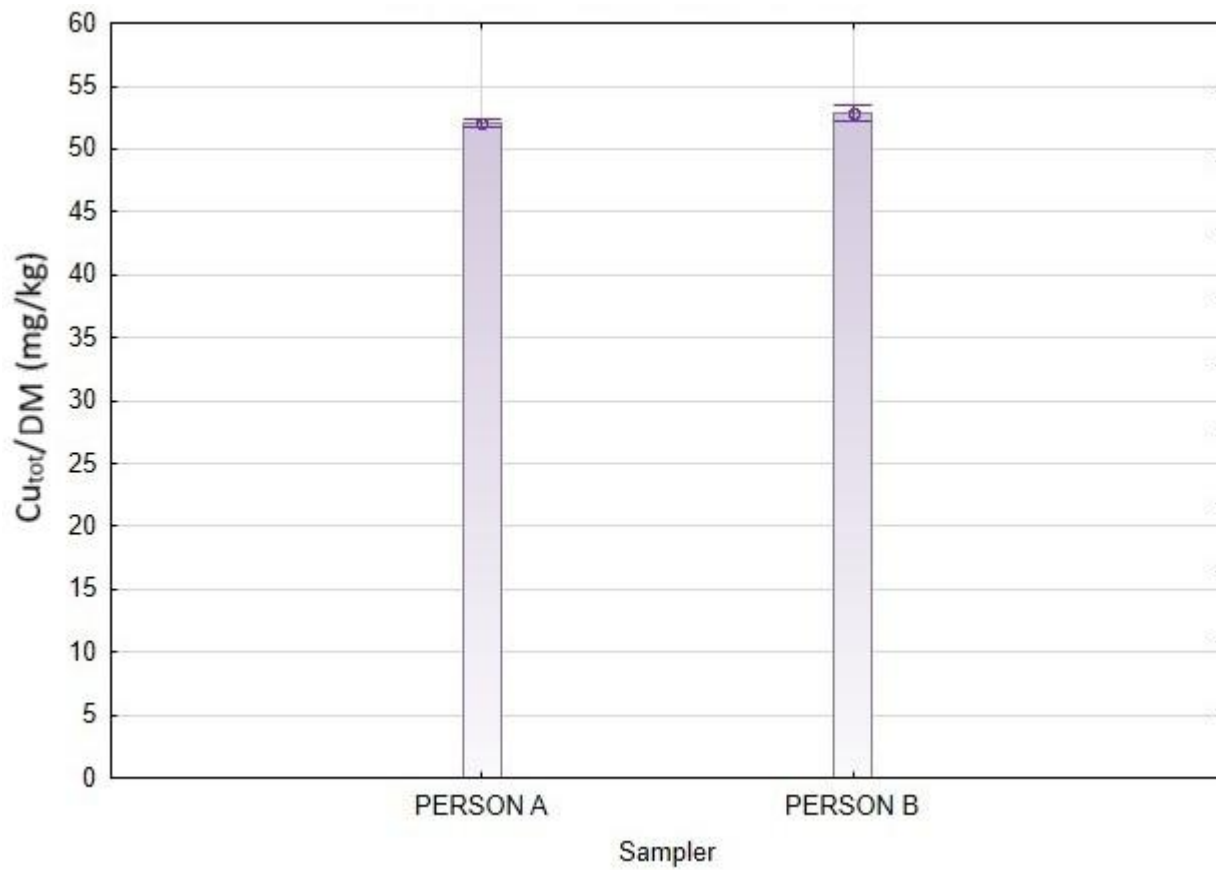
Sampler	Cd _{tot} /DM (mg/kg) (weighted average)	Cd _{tot} /DM (mg/kg) (SEM)	Cd _{tot} /DM (mg/kg) (-SEM)	Cd _{tot} /DM (mg/kg) (+SEM)	N
PERSON A	0,196667	0,001506	0,195161	0,198173	3
PERSON B	0,204367	0,004984	0,199383	0,209351	3

Note: SEM – Standard Error of the Mean

Tukey's Honest Significant Difference (HSD) test

Sampler	Cd _{tot} /DM (mg/kg) (weighted average)	1	2
PERSON A	0,196667	****	
PERSON B	0,204367	****	

(d) Cu



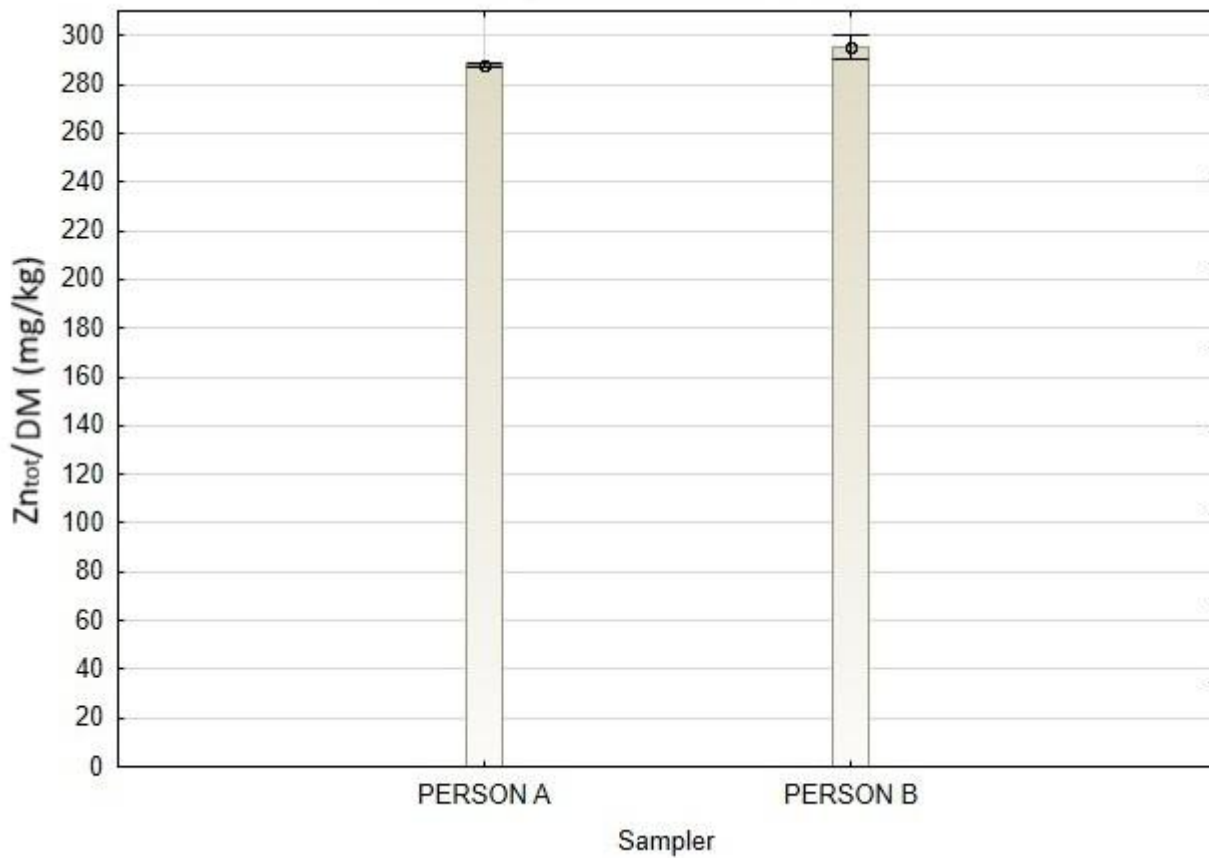
Sampler	Cu _{tot} /DM (mg/kg) (weighted average)	Cu _{tot} /DM (mg/kg) (SEM)	Cu _{tot} /DM (mg/kg) (-SEM)	Cu _{tot} /DM (mg/kg) (+SEM)	N
PERSON A	52,06333	0,308185	51,75515	52,37152	3
PERSON B	52,79333	0,619821	52,17351	53,41315	3

Note: SEM – Standard Error of the Mean

Tukey's Honest Significant Difference (HSD) test

Sampler	Cu _{tot} /DM (mg/kg) (weighted average)	1	2
PERSON A	52,06333	****	
PERSON B	52,79333	****	

(e) Zn



Sampler	Zn _{tot} /DM (mg/kg) (weighted average)	Zn _{tot} /DM (mg/kg) (SEM)	Zn _{tot} /DM (mg/kg) (-SEM)	Zn _{tot} /DM (mg/kg) (+SEM)	N
PERSON A	287,7000	0,635085	287,0649	288,3351	3
PERSON B	295,3000	4,635731	290,6643	299,9357	3

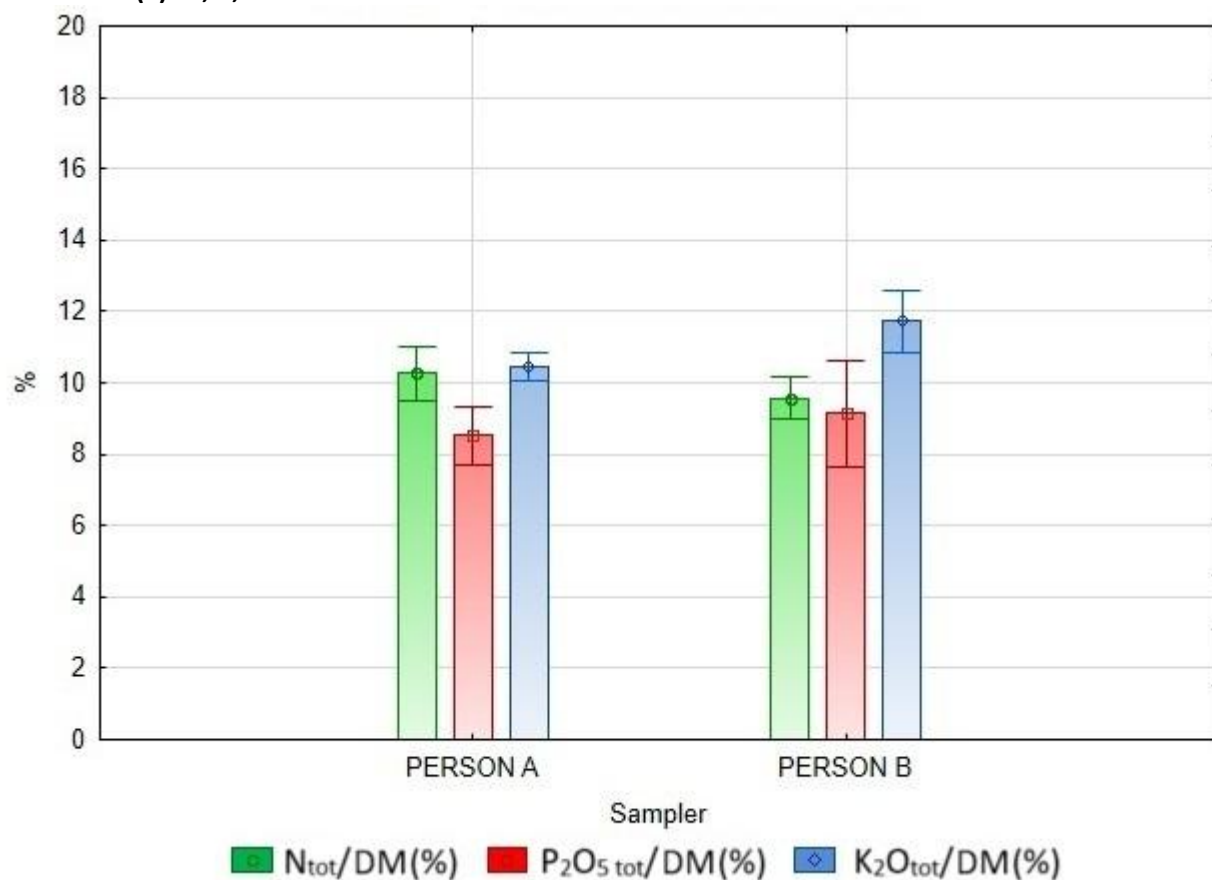
Note: SEM – Standard Error of the Mean

Tukey's Honest Significant Difference (HSD) test

Sampler	Zn _{tot} /DM (mg/kg) (weighted average)	1	2
PERSON A	287,7000	****	
PERSON B	295,3000	****	

9.2. Blend 1 – final samples

(a) N, P, K



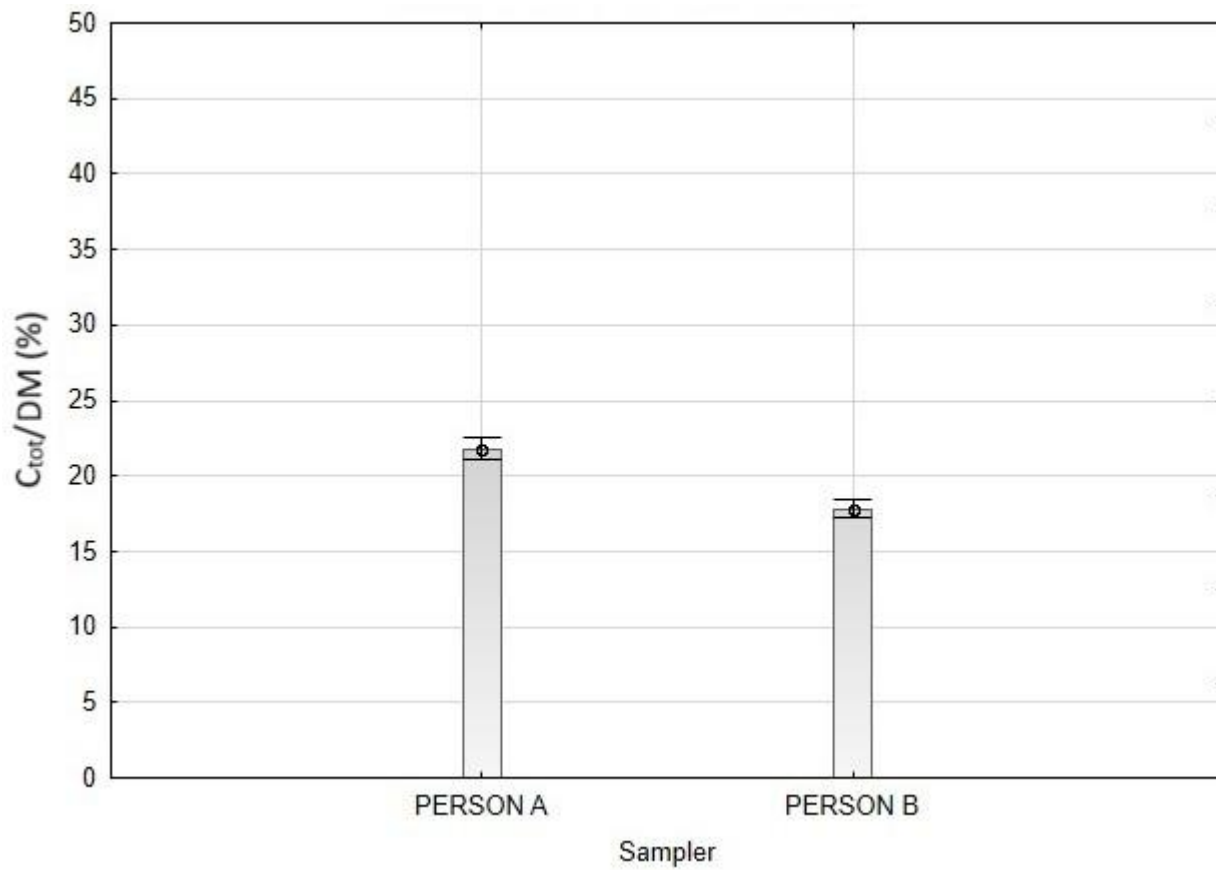
Sampler	N _{tot} /DM (%) (weighted average)	N _{tot} /DM (%) (SEM)	N _{tot} /DM (%) (-SEM)	N _{tot} /DM (%) (+SEM)	N
PERSON A	10,26333	0,179382	10,083952	10,442715	3
PERSON B	9,58000	0,134288	9,445712	9,714288	3
	P ₂ O ₅ tot/DM (%) (weighted average)	P ₂ O ₅ tot/DM (%) (SEM)	P ₂ O ₅ tot/DM (%) (-SEM)	P ₂ O ₅ tot/DM (%) (+SEM)	N
PERSON A	8,540000	0,189297	8,350703	8,729297	3
PERSON B	9,136667	0,351014	8,785652	9,487681	3
	K ₂ O _{tot} /DM (%) (weighted average)	K ₂ O _{tot} /DM (%) (SEM)	K ₂ O _{tot} /DM (%) (-SEM)	K ₂ O _{tot} /DM (%) (+SEM)	N
PERSON A	10,45667	0,086667	10,370000	10,543333	3
PERSON B	11,72000	0,205020	11,514980	11,925020	3

Note: SEM – Standard Error of the Mean

Tukey's Honest Significant Difference (HSD) test

Sampler	N _{tot} /DM (%) (weighted average)	1	2
PERSON A	10,26333		****
PERSON B	9,58	****	
Sampler	P ₂ O ₅ tot/DM (%) (weighted average)	1	2
PERSON A	8,540000	****	
PERSON B	9,136667	****	
Sampler	K ₂ O _{tot} /DM (%) (weighted average)	1	2
PERSON A	10,45667	****	
PERSON B	11,72000		****

(b) C_{tot}



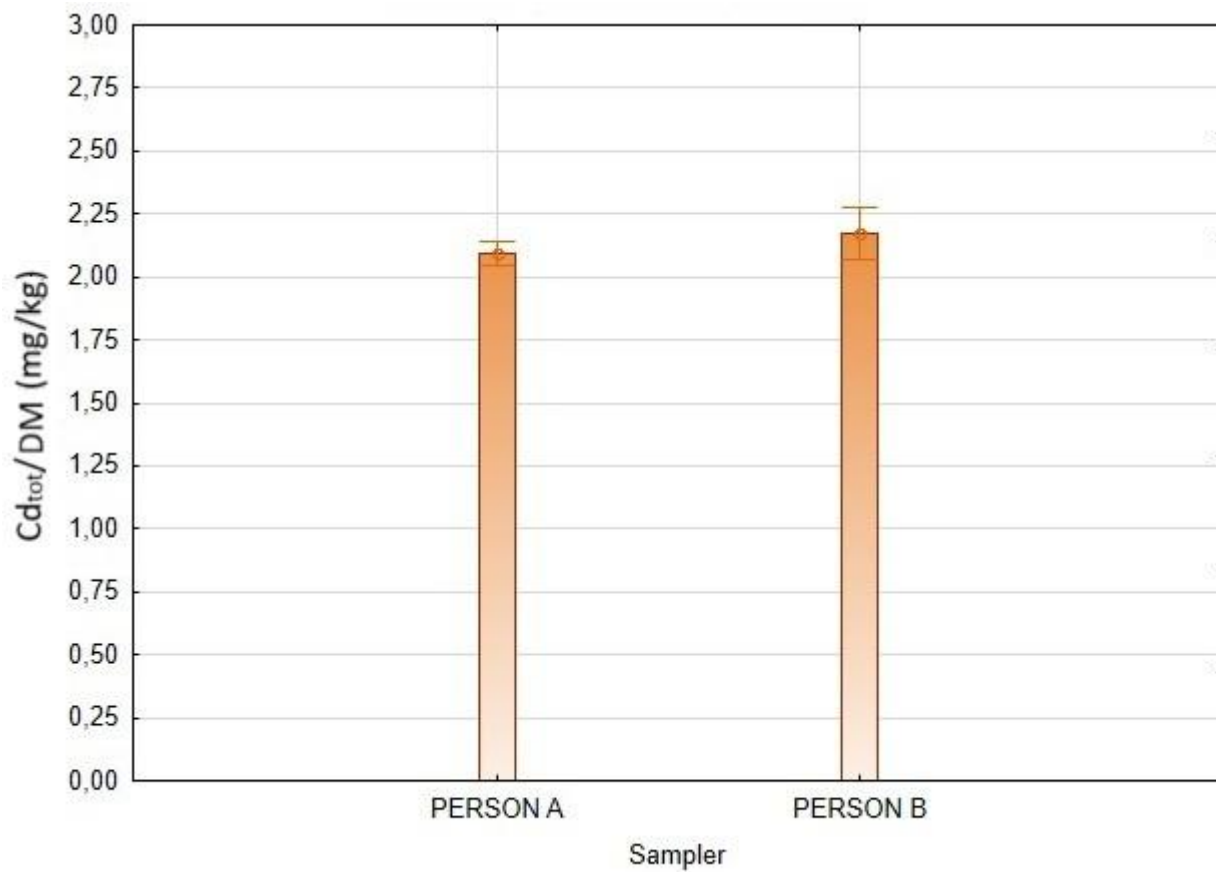
Sampler	C_{tot}/DM (%) (weighted average)	C_{tot}/DM (%) (SEM)	C_{tot}/DM (%) (-SEM)	C_{tot}/DM (%) (+SEM)	N
PERSON A	21,82667	0,721349	21,10532	22,54802	3
PERSON B	17,85000	0,614898	17,23510	18,46490	3

Note: SEM – Standard Error of the Mean

Tukey's Honest Significant Difference (HSD) test

Sampler	C_{tot}/DM (%) (weighted average)	1	2
PERSON A	21,82667		****
PERSON B	17,85000	****	

(c) Cd



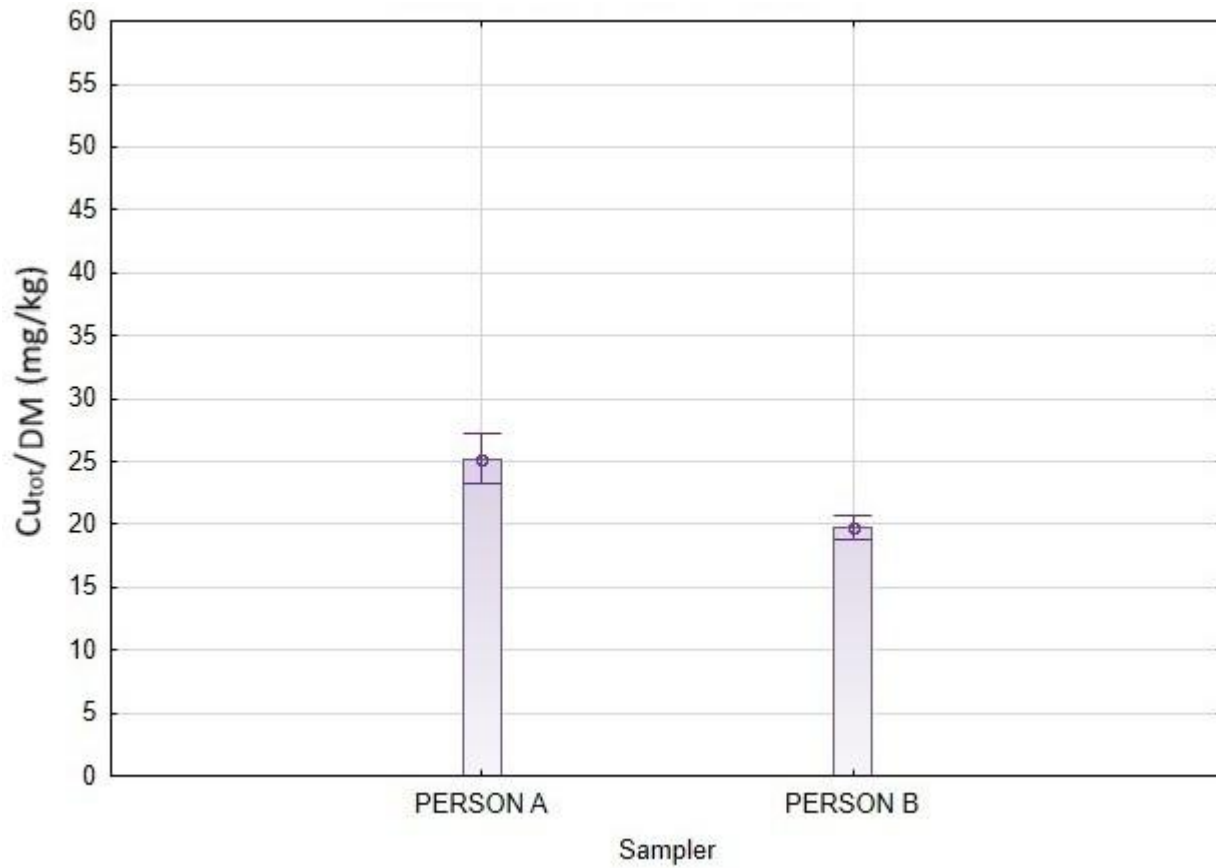
Sampler	Cd _{tot} /DM (mg/kg) (weighted average)	Cd _{tot} /DM (mg/kg) (SEM)	Cd _{tot} /DM (mg/kg) (-SEM)	Cd _{tot} /DM (mg/kg) (+SEM)	N
PERSON A	2,092333	0,049465	2,042868	2,141798	3
PERSON B	2,173667	0,106427	2,067239	2,280094	3

Note: SEM – Standard Error of the Mean

Tukey's Honest Significant Difference (HSD) test

Sampler	Cd _{tot} /DM (mg/kg) (weighted average)	1	2
PERSON A	2,092333	****	
PERSON B	2,173667	****	

(d) Cu



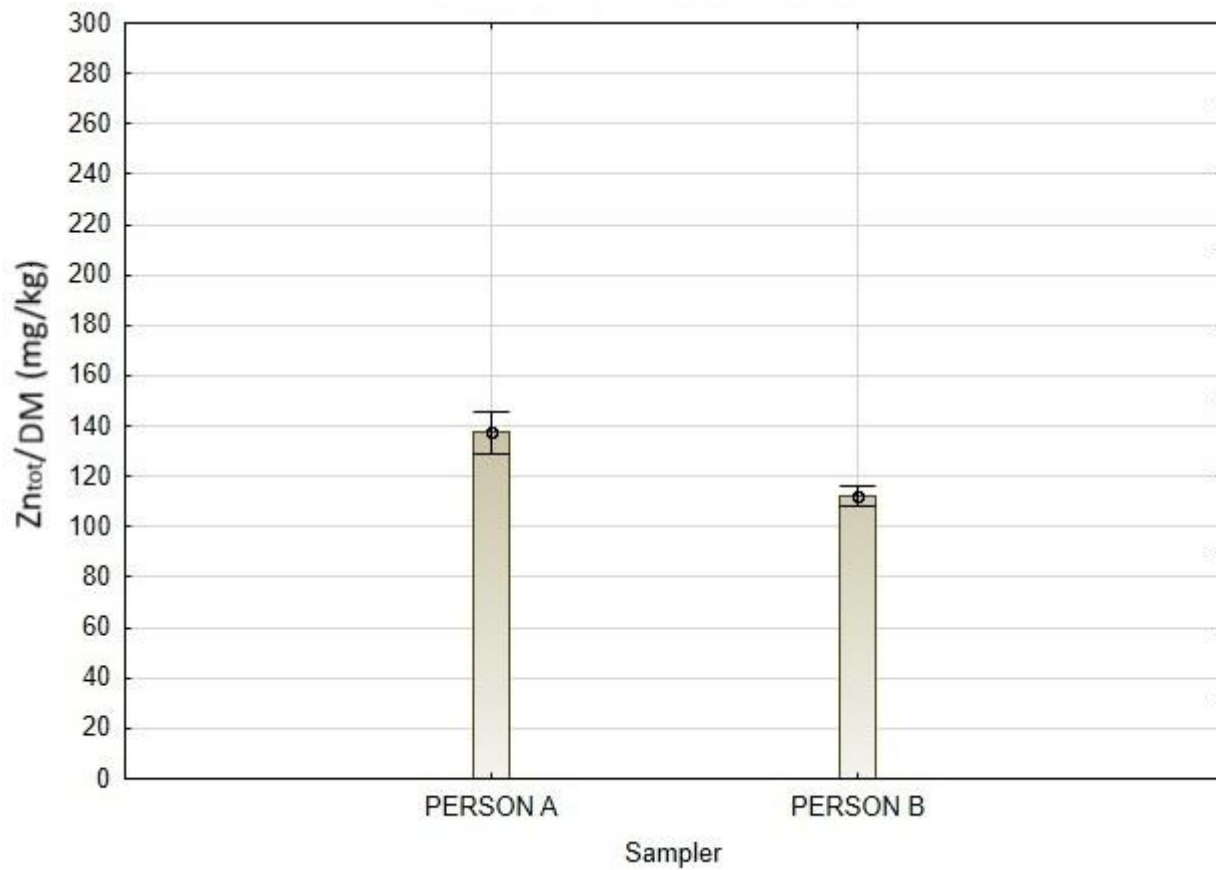
Sampler	Cu _{tot} /DM (mg/kg) (weighted average)	Cu _{tot} /DM (mg/kg) (SEM)	Cu _{tot} /DM (mg/kg) (-SEM)	Cu _{tot} /DM (mg/kg) (+SEM)	N
PERSON A	25,21667	2,011172	23,20550	27,22784	3
PERSON B	19,77333	0,973607	18,79973	20,74694	3

Note: SEM – Standard Error of the Mean

Tukey's Honest Significant Difference (HSD) test

Sampler	Cu _{tot} /DM (mg/kg) (weighted average)	1	2
PERSON A	25,21667	****	
PERSON B	19,77333	****	

(e) Zn



Sampler	Zn _{tot} /DM (mg/kg) (weighted average)	Zn _{tot} /DM (mg/kg) (SEM)	Zn _{tot} /DM (mg/kg) (-SEM)	Zn _{tot} /DM (mg/kg) (+SEM)	N
PERSON A	137,3333	8,066460	129,2669	145,3998	3
PERSON B	112,0000	4,059557	107,9404	116,0596	3

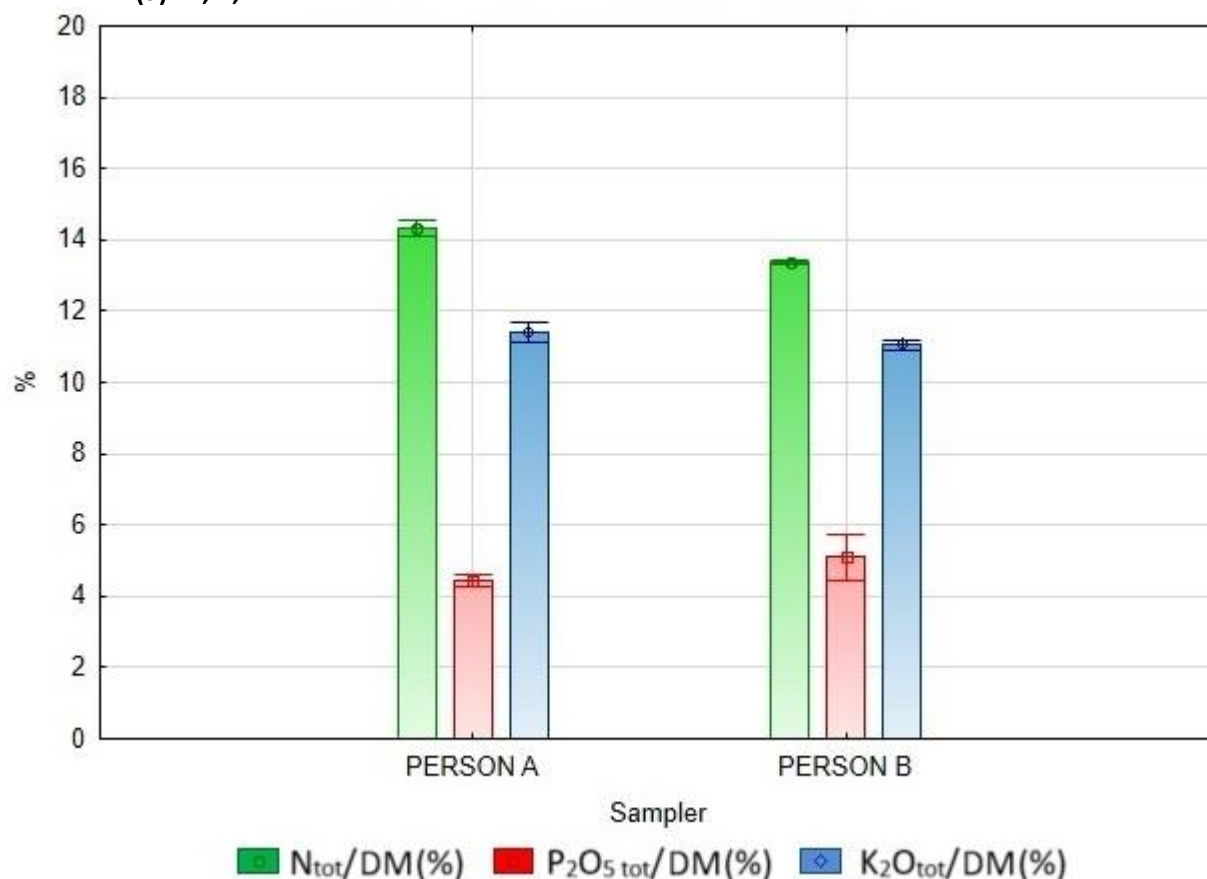
Note: SEM – Standard Error of the Mean

Tukey's Honest Significant Difference (HSD) test

Sampler	Zn _{tot} /DM (mg/kg) (weighted average)	1	2
PERSON A	137,3333		****
PERSON B	112,0000	****	

9.3. Blend 2 – final samples

(a) N, P, K



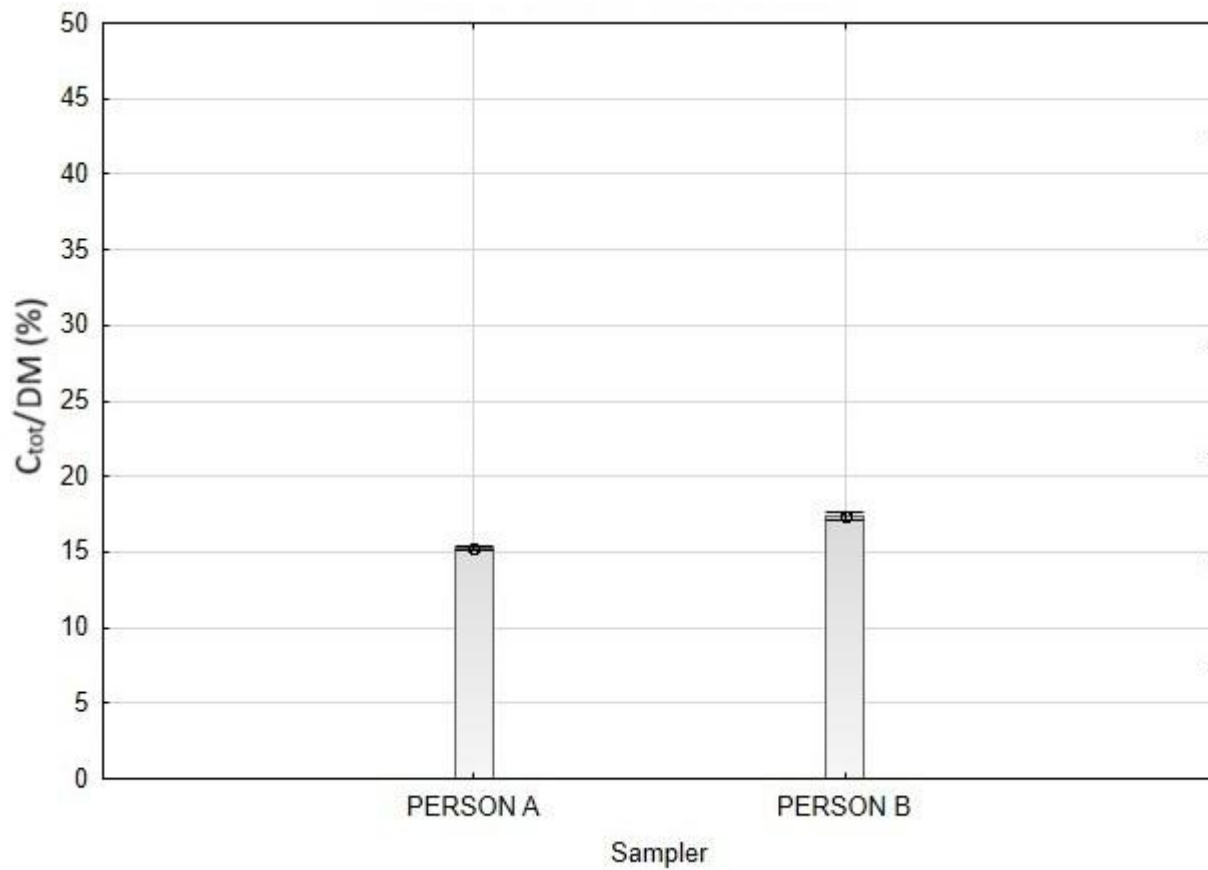
Sampler	N _{tot} /DM (%) (weighted average)	N _{tot} /DM (%) (SEM)	N _{tot} /DM (%) (-SEM)	N _{tot} /DM (%) (+SEM)	N
PERSON A	14,31333	0,230964	14,08237	14,54430	3
PERSON B	13,38333	0,069362	13,31397	13,45270	3
	P ₂ O ₅ tot/DM (%) (weighted average)	P ₂ O ₅ tot/DM (%) (SEM)	P ₂ O ₅ tot/DM (%) (-SEM)	P ₂ O ₅ tot/DM (%) (+SEM)	N
PERSON A	4,430000	0,185831	4,244169	4,615831	3
PERSON B	5,103333	0,640685	4,462648	5,744019	3
	K ₂ O _{tot} /DM (%) (weighted average)	K ₂ O _{tot} /DM (%) (SEM)	K ₂ O _{tot} /DM (%) (-SEM)	K ₂ O _{tot} /DM (%) (+SEM)	N
PERSON A	11,40333	0,301128	11,10221	11,70446	3
PERSON B	11,06333	0,136789	10,92654	11,20012	3

Note: SEM – Standard Error of the Mean

Tukey's Honest Significant Difference (HSD) test

Sampler	N _{tot} /DM (%) (weighted average)	1	2
PERSON A	14,31333		****
PERSON B	13,38333	****	
Sampler	P ₂ O ₅ tot/DM (%) (weighted average)	1	2
PERSON A	4,430000	****	
PERSON B	5,103333	****	
Sampler	K ₂ O _{tot} /DM (%) (weighted average)	1	2
PERSON A	11,40333	****	
PERSON B	11,06333	****	

(b) C_{tot}



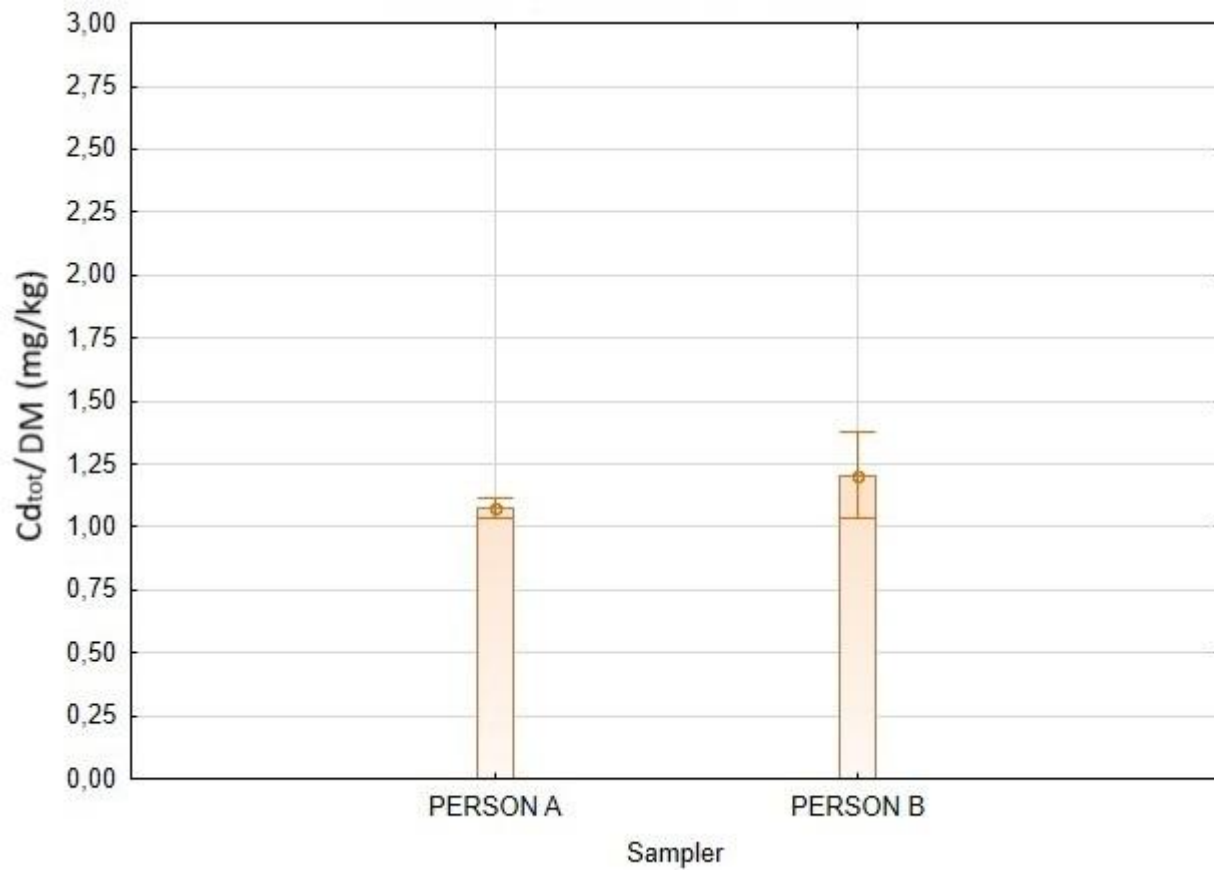
Sampler	C_{tot}/DM (%) (weighted average)	C_{tot}/DM (%) (SEM)	C_{tot}/DM (%) (-SEM)	C_{tot}/DM (%) (+SEM)	N
PERSON A	15,21667	0,158990	15,05768	15,37566	3
PERSON B	17,38667	0,309857	17,07681	17,69652	3

Note: SEM – Standard Error of the Mean

Tukey's Honest Significant Difference (HSD) test

Sampler	C_{tot}/DM (%) (weighted average)	1	2
PERSON A	15,21667	****	
PERSON B	17,38667		****

(c) Cd



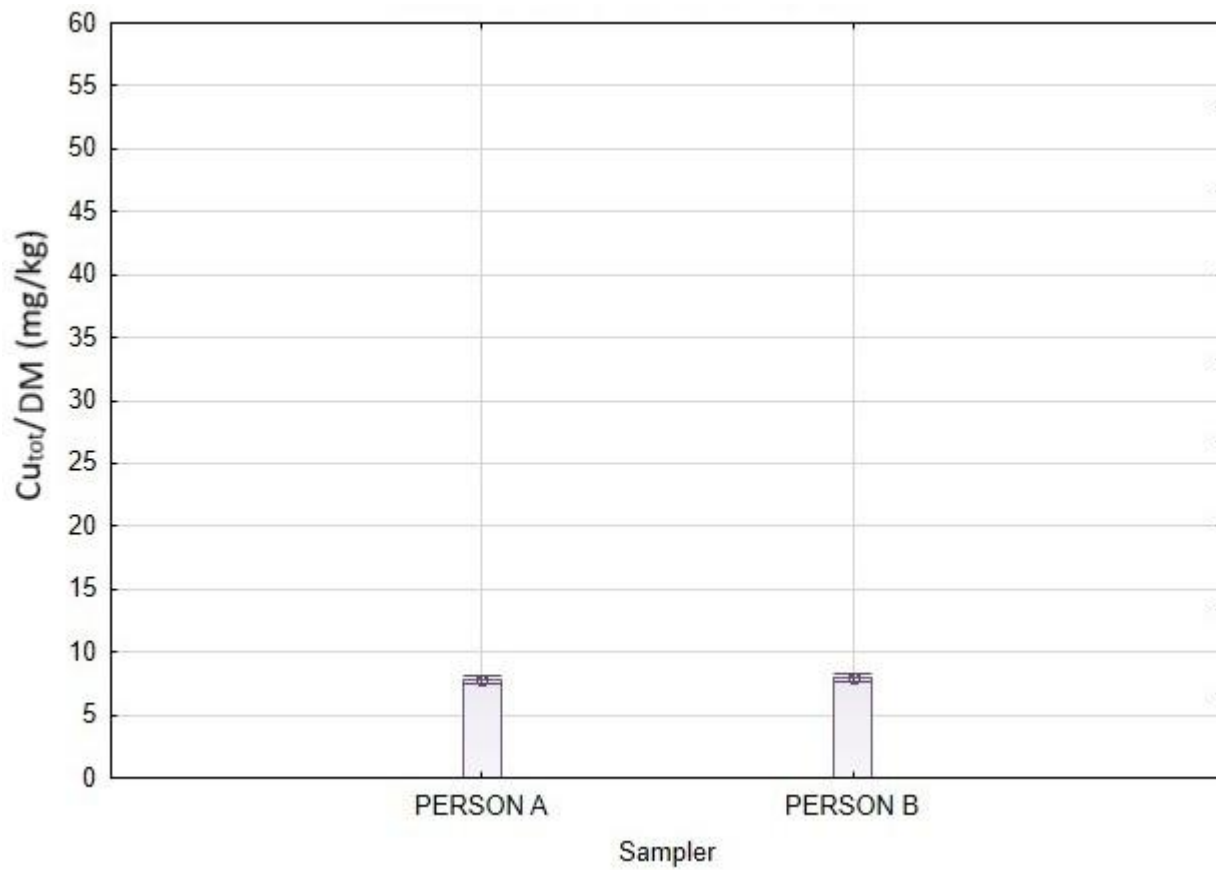
Sampler	Cd _{tot} /DM (mg/kg) (weighted average)	Cd _{tot} /DM (mg/kg) (SEM)	Cd _{tot} /DM (mg/kg) (-SEM)	Cd _{tot} /DM (mg/kg) (+SEM)	N
PERSON A	1,073667	0,040482	1,033185	1,114148	3
PERSON B	1,205533	0,168719	1,036814	1,374253	3

Note: SEM – Standard Error of the Mean

Tukey's Honest Significant Difference (HSD) test

Sampler	Cd _{tot} /DM (mg/kg) (weighted average)	1	2
PERSON A	1,073667	****	
PERSON B	1,205533	****	

(d) Cu



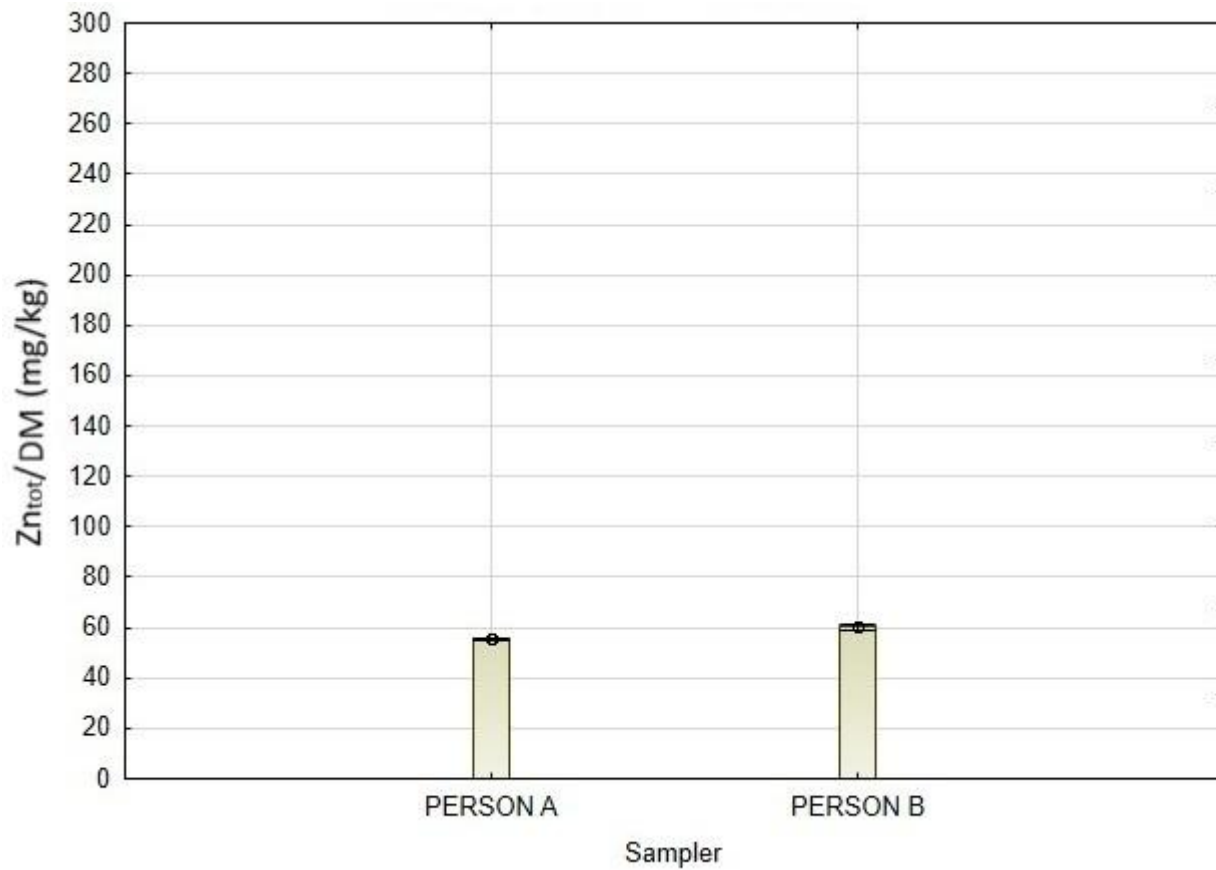
Sampler	Cu _{tot} /DM (mg/kg) (weighted average)	Cu _{tot} /DM (mg/kg) (SEM)	Cu _{tot} /DM (mg/kg) (-SEM)	Cu _{tot} /DM (mg/kg) (+SEM)	N
PERSON A	7,809333	0,297828	7,511505	8,107161	3
PERSON B	7,964000	0,261662	7,702338	8,225662	3

Note: SEM – Standard Error of the Mean

Tukey's Honest Significant Difference (HSD) test

Sampler	Cu _{tot} /DM (mg/kg) (weighted average)	1	2
PERSON A	7,809333	****	
PERSON B	7,964000	****	

(e) Zn



Sampler	Zn _{tot} /DM (mg/kg) (weighted average)	Zn _{tot} /DM (mg/kg) (SEM)	Zn _{tot} /DM (mg/kg) (-SEM)	Zn _{tot} /DM (mg/kg) (+SEM)	N
PERSON A	55,54000	0,433167	55,10683	55,97317	3
PERSON B	60,32000	1,253010	59,06699	61,57301	3

Note: SEM – Standard Error of the Mean

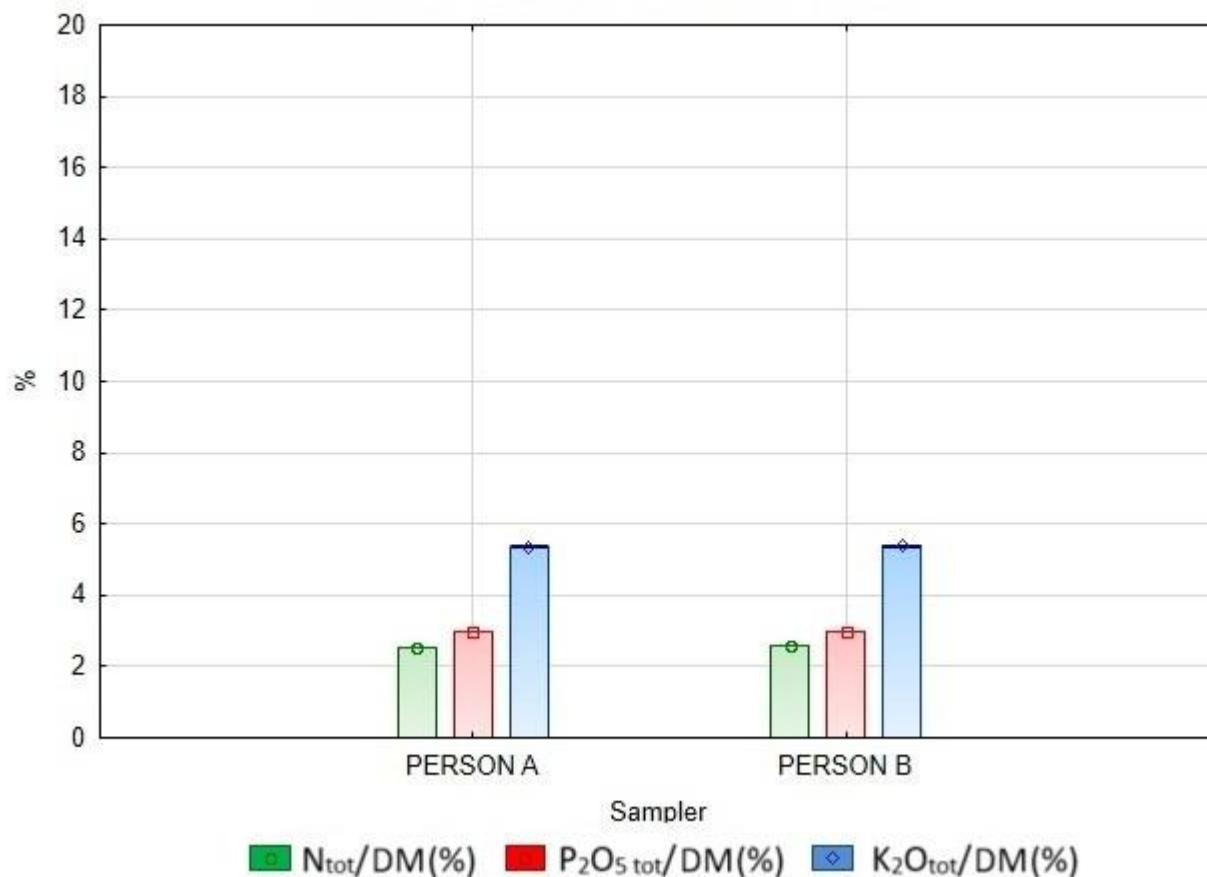
Tukey's Honest Significant Difference (HSD) test

Sampler	Zn _{tot} /DM (mg/kg) (weighted average)	1	2
PERSON A	55,54000	****	
PERSON B	60,32000		****

10. Static sampling – whole cone

10.1. Dried pelleted manure – incremental samples

(a) N, P, K



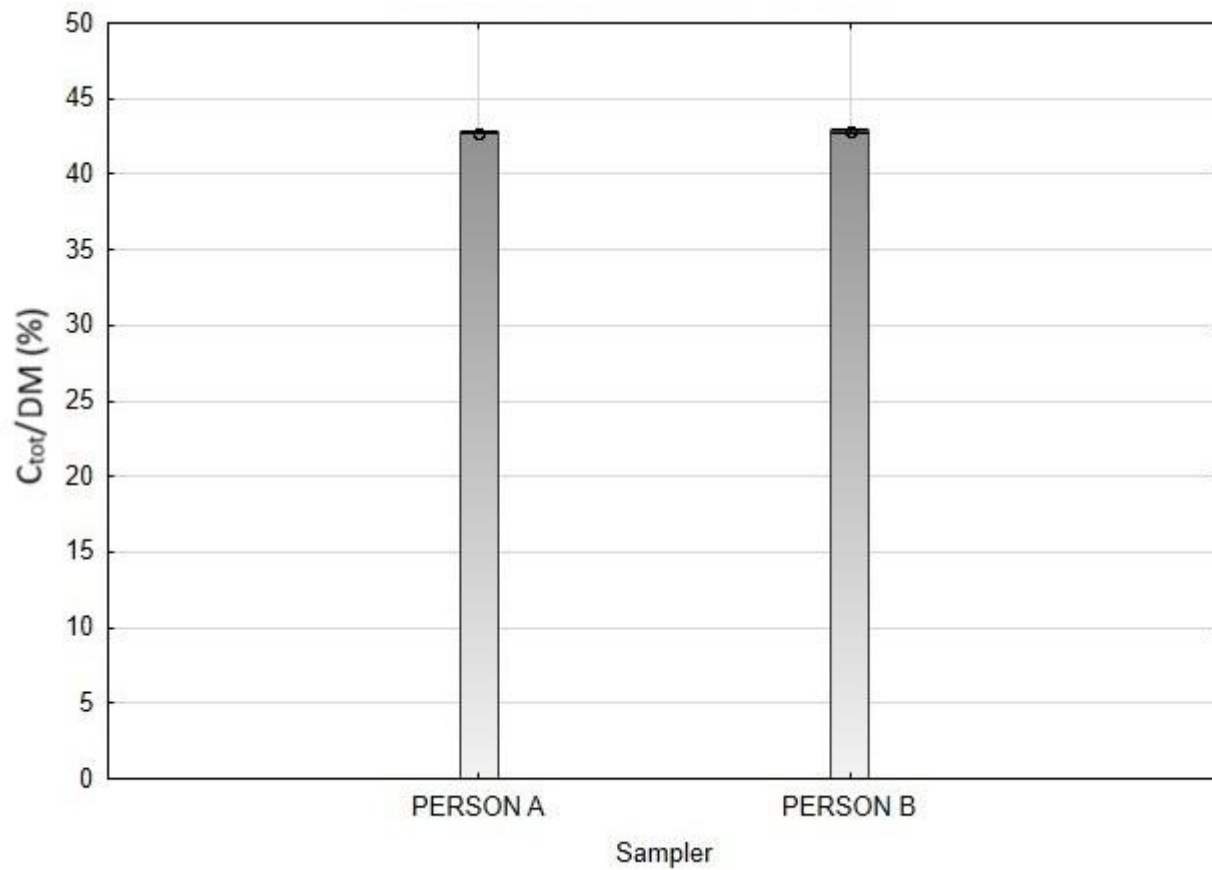
Sampler	N _{tot} /DM (%) (weighted average)	N _{tot} /DM (%) (SEM)	N _{tot} /DM (%) (-SEM)	N _{tot} /DM (%) (+SEM)	N
PERSON A	2,551000	0,006362	2,544638	2,557362	20
PERSON B	2,584000	0,006782	2,577218	2,590782	20
	P ₂ O ₅ tot/DM (%) (weighted average)	P ₂ O ₅ tot/DM (%) (SEM)	P ₂ O ₅ tot/DM (%) (-SEM)	P ₂ O ₅ tot/DM (%) (+SEM)	N
PERSON A	2,977500	0,008762	2,968738	2,986262	20
PERSON B	2,994000	0,012925	2,981075	3,006925	20
	K ₂ Otot/DM (%) (weighted average)	K ₂ Otot/DM (%) (SEM)	K ₂ Otot/DM (%) (-SEM)	K ₂ Otot/DM (%) (+SEM)	N
PERSON A	5,361000	0,018833	5,342167	5,379833	20
PERSON B	5,369000	0,017349	5,351651	5,386349	20

Note: SEM – Standard Error of the Mean

Tukey's Honest Significant Difference (HSD) test

Sampler	N _{tot} /DM (%) (weighted average)	1	2
PERSON A	2,551000	****	
PERSON B	2,584000		****
Sampler	P ₂ O ₅ tot/DM (%) (weighted average)	1	2
PERSON A	2,977500	****	
PERSON B	2,994000	****	
Sampler	K ₂ Otot/DM (%) (weighted average)	1	2
PERSON A	5,361000	****	
PERSON B	5,369000	****	

(b) C_{tot}



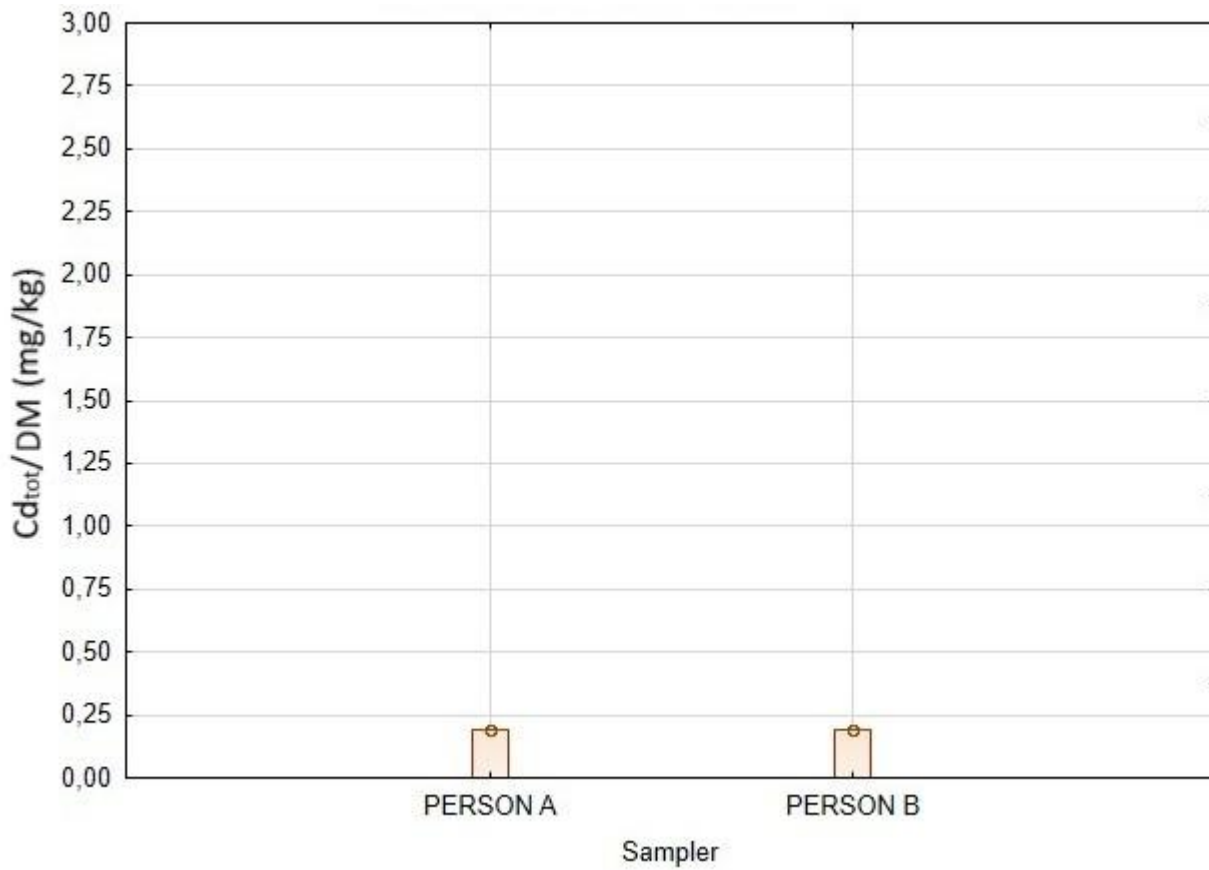
Sampler	C_{tot}/DM (%) (weighted average)	C_{tot}/DM (%) (SEM)	C_{tot}/DM (%) (-SEM)	C_{tot}/DM (%) (+SEM)	N
PERSON A	42,74850	0,100771	42,64773	42,84927	20
PERSON B	42,86750	0,123852	42,74365	42,99135	20

Note: SEM – Standard Error of the Mean

Tukey's Honest Significant Difference (HSD) test

Sampler	C_{tot}/DM (%) (weighted average)	1	2
PERSON A	42,74850	****	
PERSON B	42,86750	****	

(c) Cd



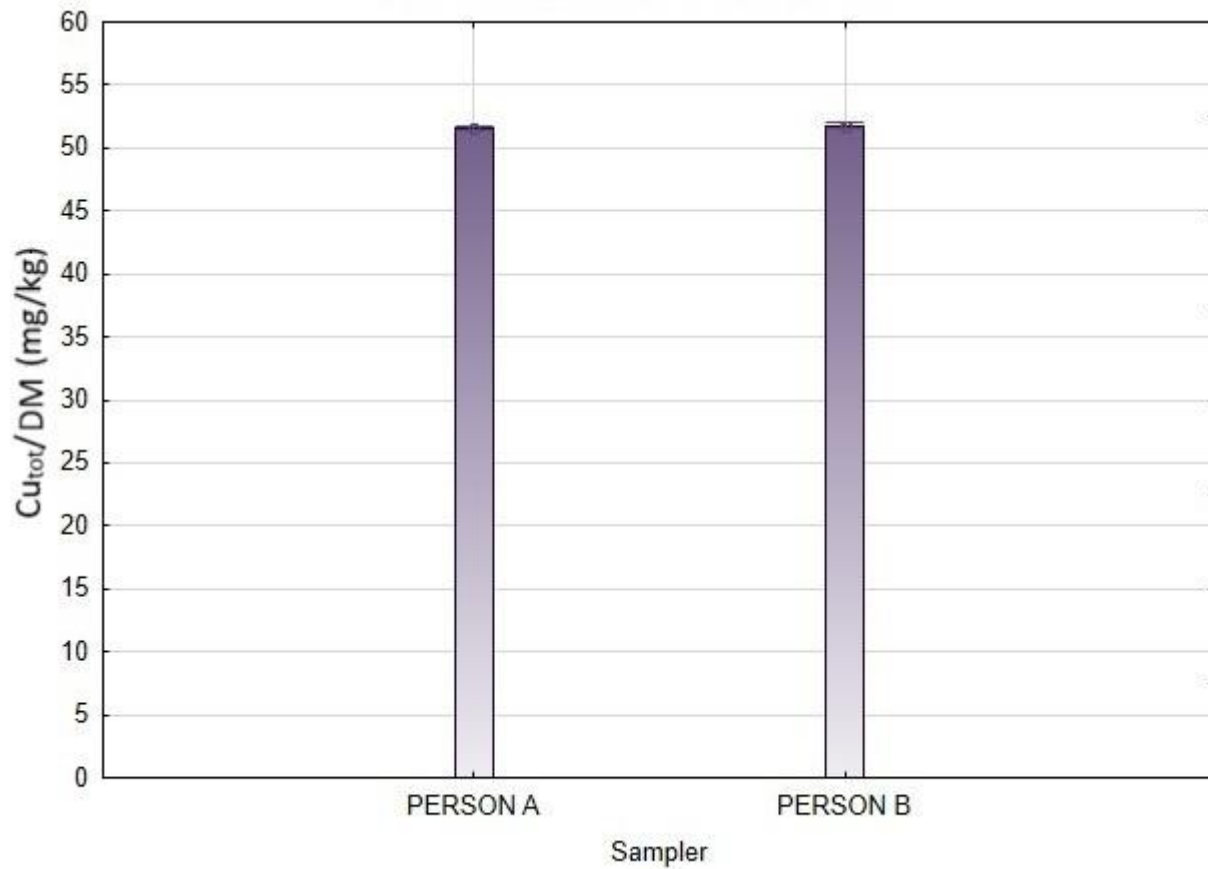
Sampler	Cd _{tot} /DM (mg/kg) (weighted average)	Cd _{tot} /DM (mg/kg) (SEM)	Cd _{tot} /DM (mg/kg) (-SEM)	Cd _{tot} /DM (mg/kg) (+SEM)	N
PERSON A	0,191975	0,001595	0,190380	0,193570	20
PERSON B	0,190090	0,001912	0,188178	0,192002	20

Note: SEM – Standard Error of the Mean

Tukey's Honest Significant Difference (HSD) test

Sampler	Cd _{tot} /DM (mg/kg) (weighted average)	1	2
PERSON A	0,191975	****	
PERSON B	0,190090	****	

(d) Cu



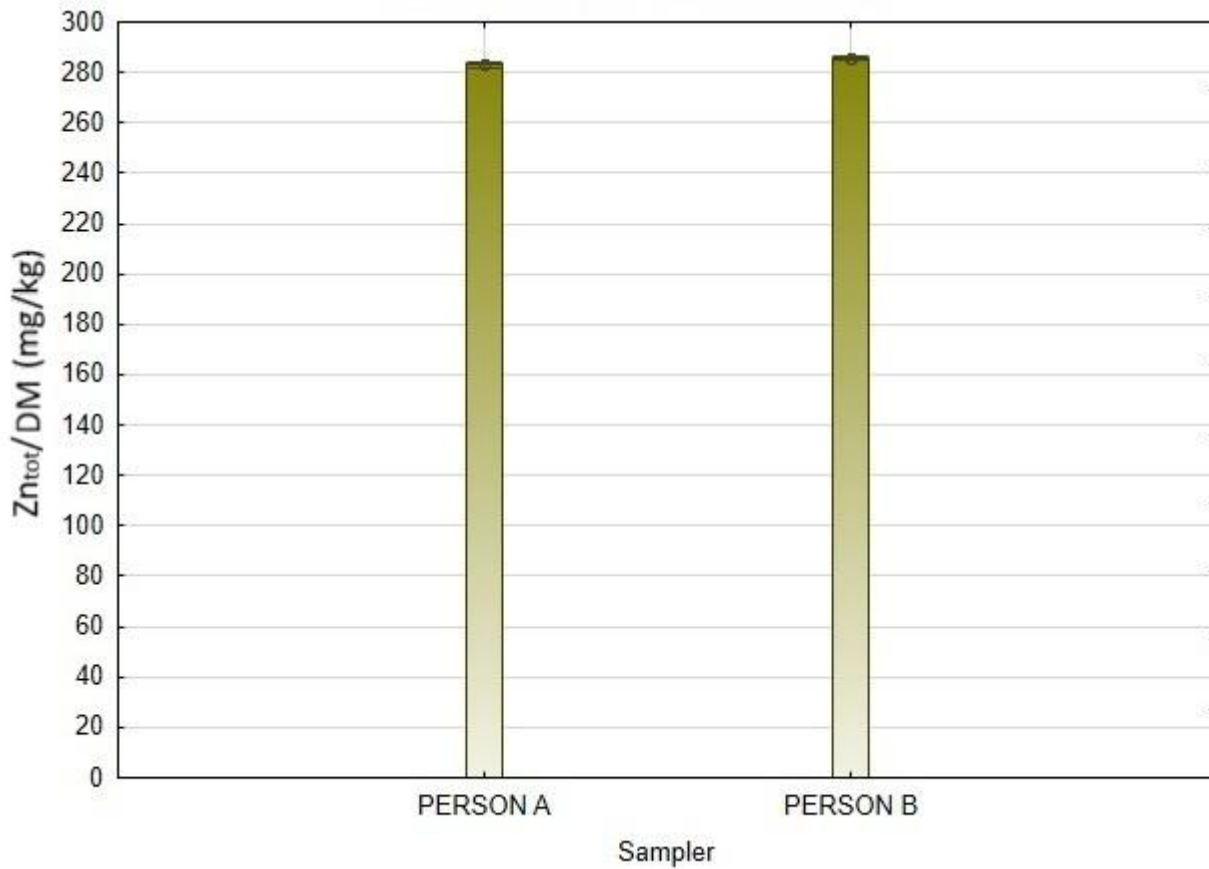
Sampler	Cu _{tot} /DM (mg/kg) (weighted average)	Cu _{tot} /DM (mg/kg) (SEM)	Cu _{tot} /DM (mg/kg) (-SEM)	Cu _{tot} /DM (mg/kg) (+SEM)	N
PERSON A	51,50900	0,146359	51,36264	51,65536	20
PERSON B	51,79500	0,191125	51,60388	51,98612	20

Note: SEM – Standard Error of the Mean

Tukey's Honest Significant Difference (HSD) test

Sampler	Cu _{tot} /DM (mg/kg) (weighted average)	1	2
PERSON A	51,50900	****	
PERSON B	51,79500	****	

(e) Zn



Sampler	Zn _{tot} /DM (mg/kg) (weighted average)	Zn _{tot} /DM (mg/kg) (SEM)	Zn _{tot} /DM (mg/kg) (-SEM)	Zn _{tot} /DM (mg/kg) (+SEM)	N
PERSON A	283,0000	0,969780	282,0302	283,9698	20
PERSON B	285,4950	0,915351	284,5796	286,4104	20

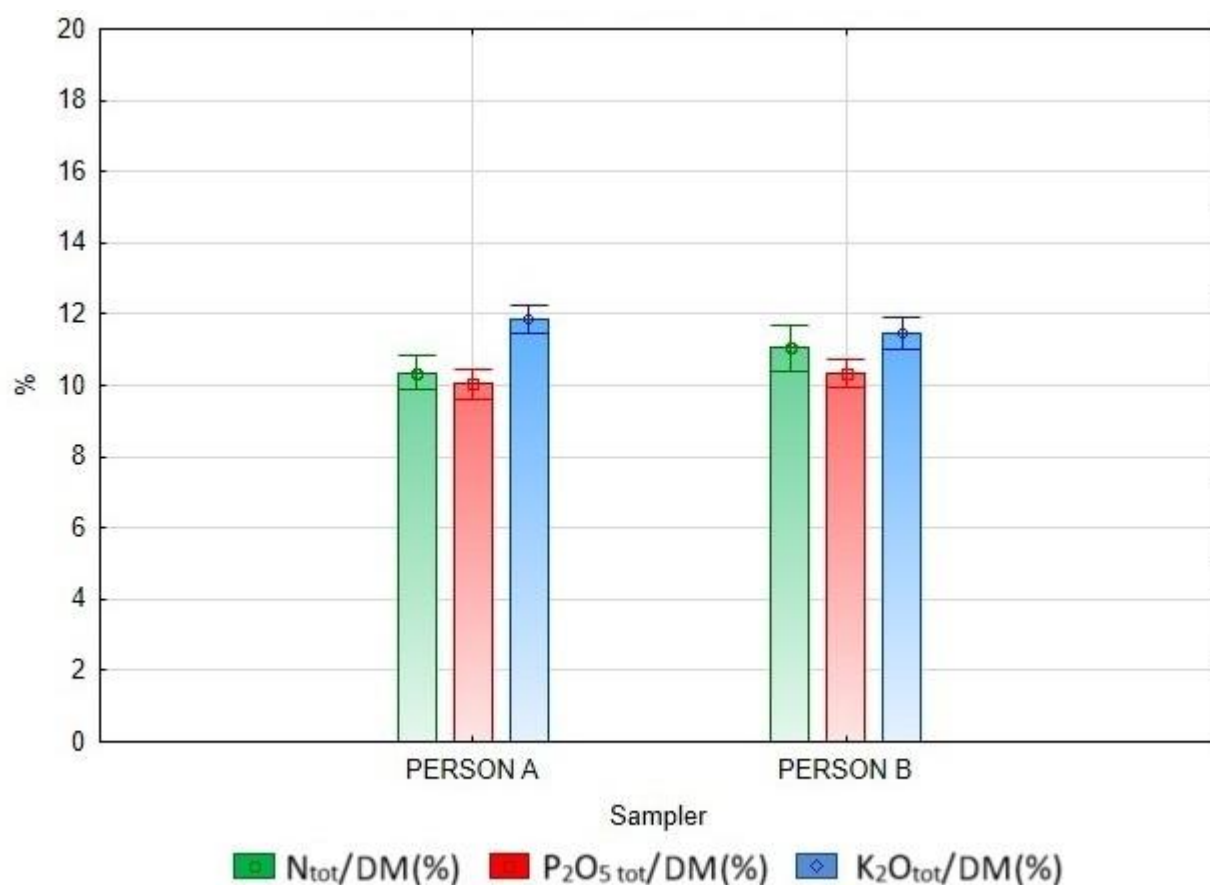
Note: SEM – Standard Error of the Mean

Tukey's Honest Significant Difference (HSD) test

Sampler	Zn _{tot} /DM (mg/kg) (weighted average)	1	2
PERSON A	283,0000	****	
PERSON B	285,4950	****	

10.2. Blend 1 – incremental samples

(a) N, P, K



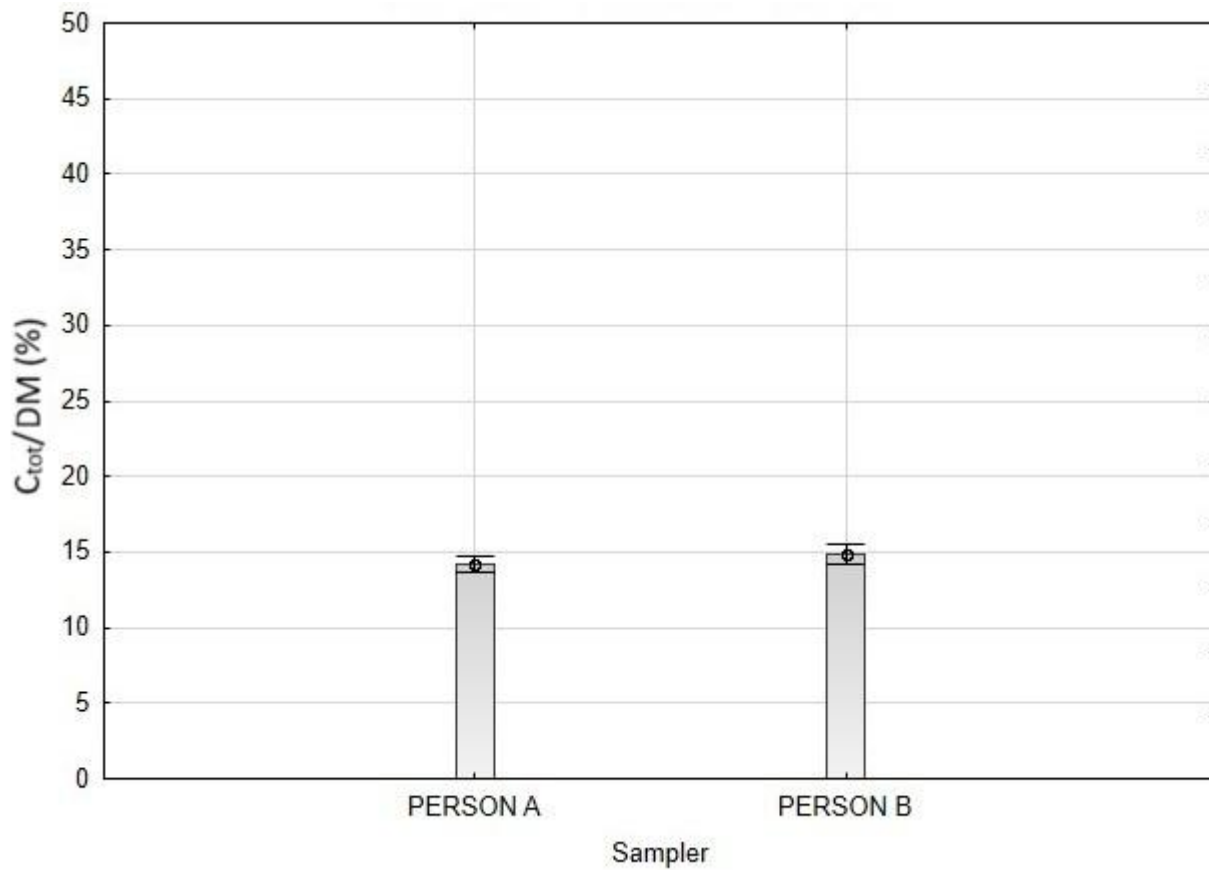
Sampler	N _{tot} /DM (%) (weighted average)	N _{tot} /DM (%) (SEM)	N _{tot} /DM (%) (-SEM)	N _{tot} /DM (%) (+SEM)	N
PERSON A	10,35750	0,489933	9,86757	10,84743	20
PERSON B	11,05150	0,658527	10,39297	11,71003	20
	P ₂ O ₅ tot/DM (%) (weighted average)	P ₂ O ₅ tot/DM (%) (SEM)	P ₂ O ₅ tot/DM (%) (-SEM)	P ₂ O ₅ tot/DM (%) (+SEM)	N
PERSON A	10,03250	0,419340	9,613160	10,45184	20
PERSON B	10,33600	0,385525	9,950475	10,72152	20
	K ₂ O _{tot} /DM (%) (weighted average)	K ₂ O _{tot} /DM (%) (SEM)	K ₂ O _{tot} /DM (%) (-SEM)	K ₂ O _{tot} /DM (%) (+SEM)	N
PERSON A	11,86450	0,412322	11,45218	12,27682	20
PERSON B	11,46450	0,431574	11,03293	11,89607	20

Note: SEM – Standard Error of the Mean

Tukey's Honest Significant Difference (HSD) test

Sampler	N _{tot} /DM (%) (weighted average)	1	2
PERSON A	10,35750	****	
PERSON B	11,05150	****	
Sampler	P ₂ O ₅ tot/DM (%) (weighted average)	1	2
PERSON A	10,03250	****	
PERSON B	10,33600	****	
Sampler	K ₂ O _{tot} /DM (%) (weighted average)	1	2
PERSON A	11,86450	****	
PERSON B	11,46450	****	

(b) C_{tot}



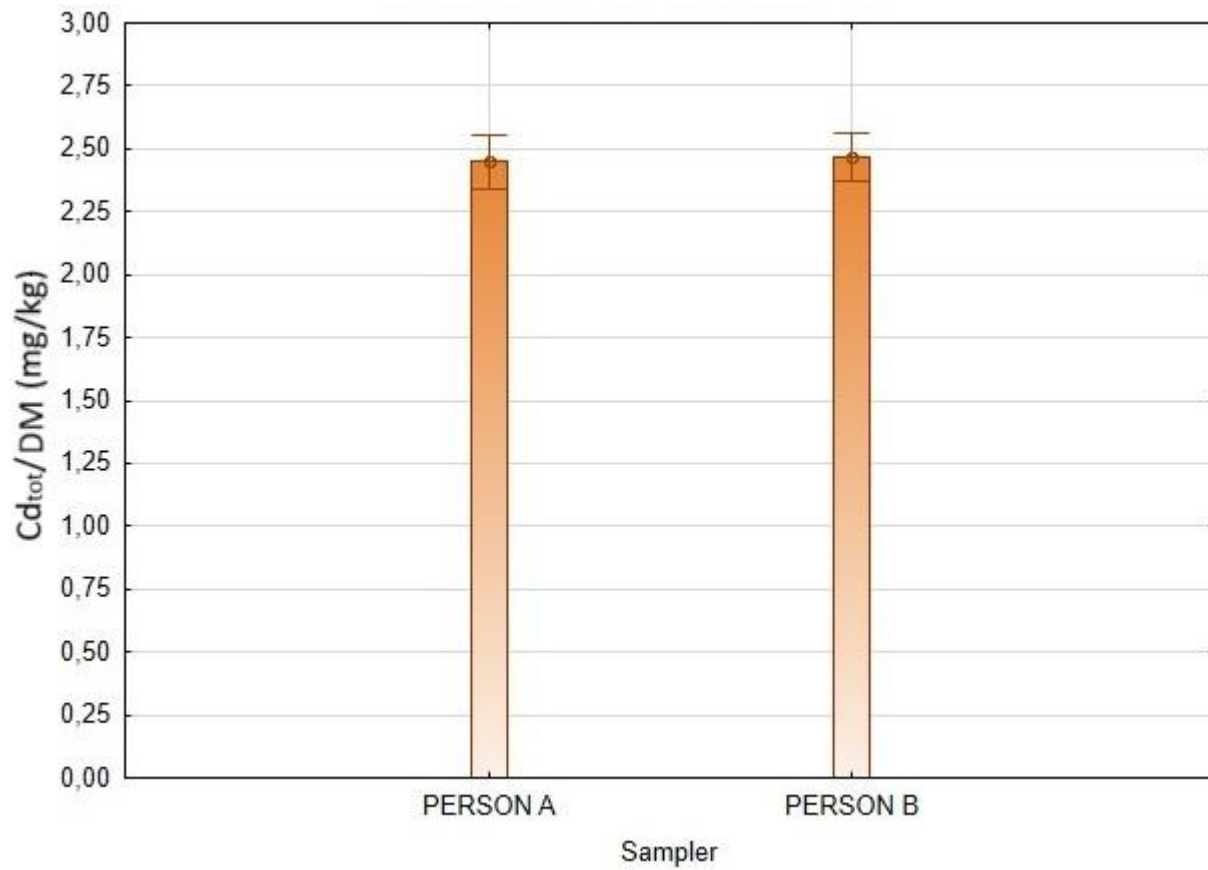
Sampler	C_{tot}/DM (%) (weighted average)	C_{tot}/DM (%) (SEM)	C_{tot}/DM (%) (-SEM)	C_{tot}/DM (%) (+SEM)	N
PERSON A	14,15650	0,534686	13,62181	14,69119	20
PERSON B	14,84500	0,704479	14,14052	15,54948	20

Note: SEM – Standard Error of the Mean

Tukey's Honest Significant Difference (HSD) test

Sampler	C_{tot}/DM (%) (weighted average)	1	2
PERSON A	14,15650	****	
PERSON B	14,84500	****	

(c) Cd



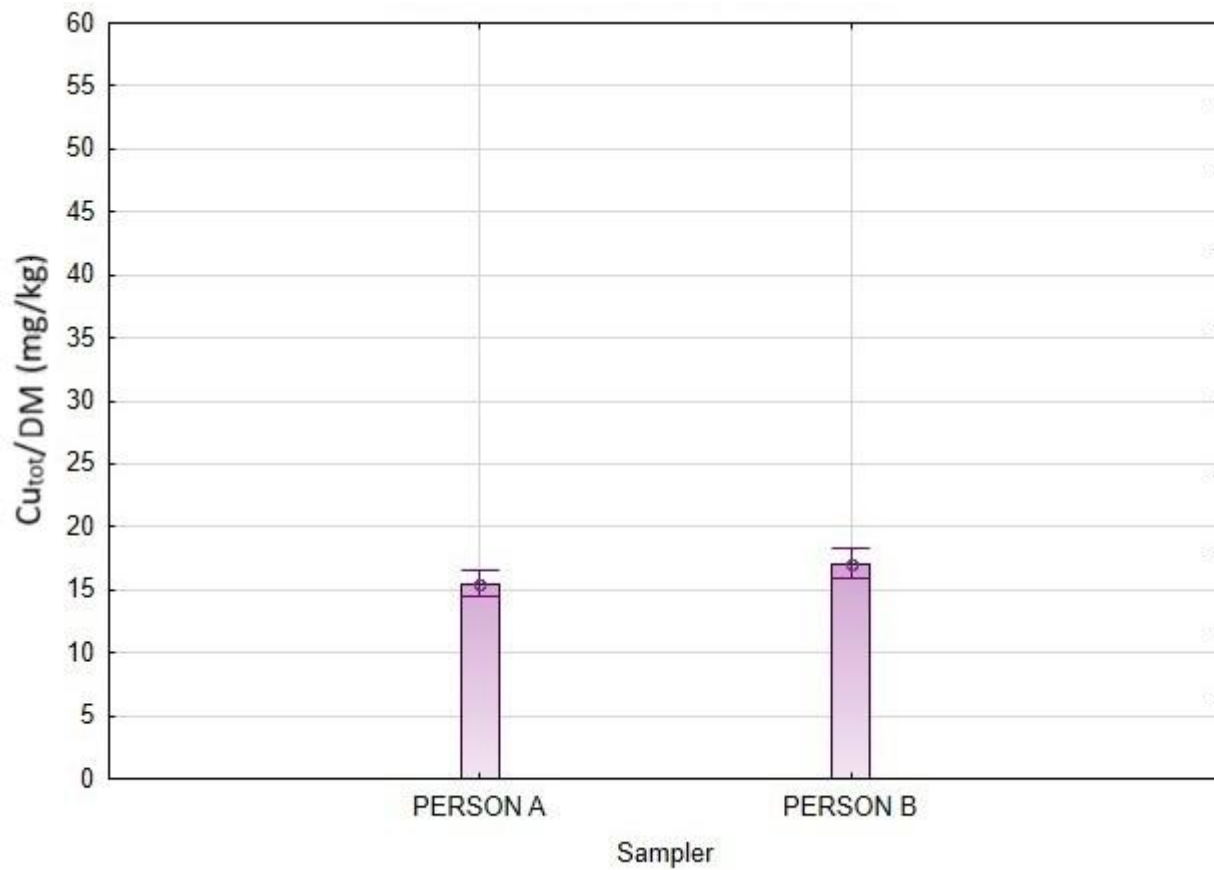
Sampler	Cd _{tot} /DM (mg/kg) (weighted average)	Cd _{tot} /DM (mg/kg) (SEM)	Cd _{tot} /DM (mg/kg) (-SEM)	Cd _{tot} /DM (mg/kg) (+SEM)	N
PERSON A	2,448000	0,105172	2,342828	2,553172	20
PERSON B	2,467850	0,094616	2,373234	2,562466	20

Note: SEM – Standard Error of the Mean

Tukey's Honest Significant Difference (HSD) test

Sampler	Cd _{tot} /DM (mg/kg) (weighted average)	1	2
PERSON A	2,448000	****	
PERSON B	2,467850	****	

(d) Cu



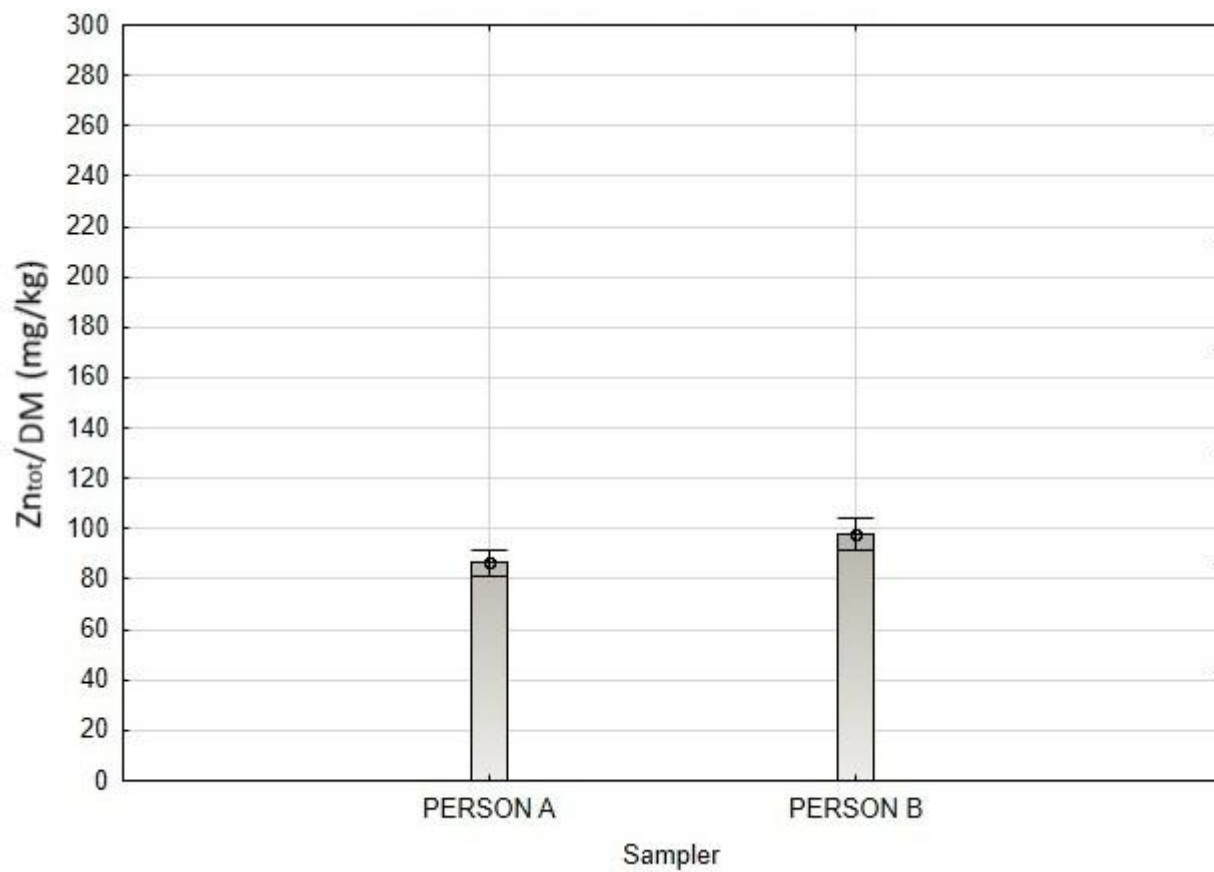
Sampler	Cu _{tot} /DM (mg/kg) (weighted average)	Cu _{tot} /DM (mg/kg) (SEM)	Cu _{tot} /DM (mg/kg) (-SEM)	Cu _{tot} /DM (mg/kg) (+SEM)	N
PERSON A	15,51940	1,018770	14,50063	16,53817	20
PERSON B	17,06700	1,222056	15,84494	18,28906	20

Note: SEM – Standard Error of the Mean

Tukey's Honest Significant Difference (HSD) test

Sampler	Cu _{tot} /DM (mg/kg) (weighted average)	1	2
PERSON A	15,51940	****	
PERSON B	17,06700	****	

(e) Zn



Sampler	Zn _{tot} /DM (mg/kg) (weighted average)	Zn _{tot} /DM (mg/kg) (SEM)	Zn _{tot} /DM (mg/kg) (-SEM)	Zn _{tot} /DM (mg/kg) (+SEM)	N
PERSON A	86,65150	5,266667	81,38483	91,9182	20
PERSON B	97,73700	6,476001	91,26100	104,2130	20

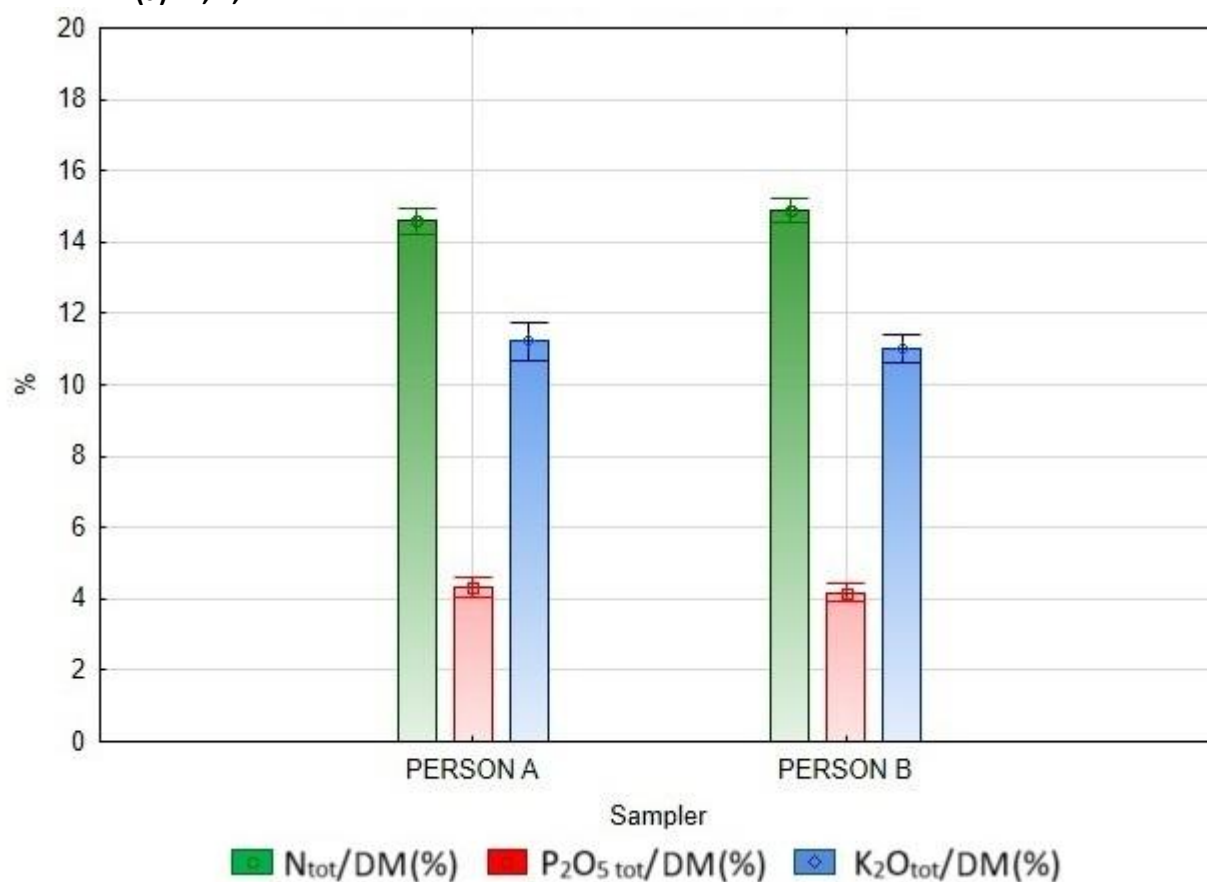
Note: SEM – Standard Error of the Mean

Tukey's Honest Significant Difference (HSD) test

Sampler	Zn _{tot} /DM (mg/kg) (weighted average)	1	2
PERSON A	86,65150	****	
PERSON B	97,73700	****	

10.3. Blend 2 – incremental samples

(a) N, P, K



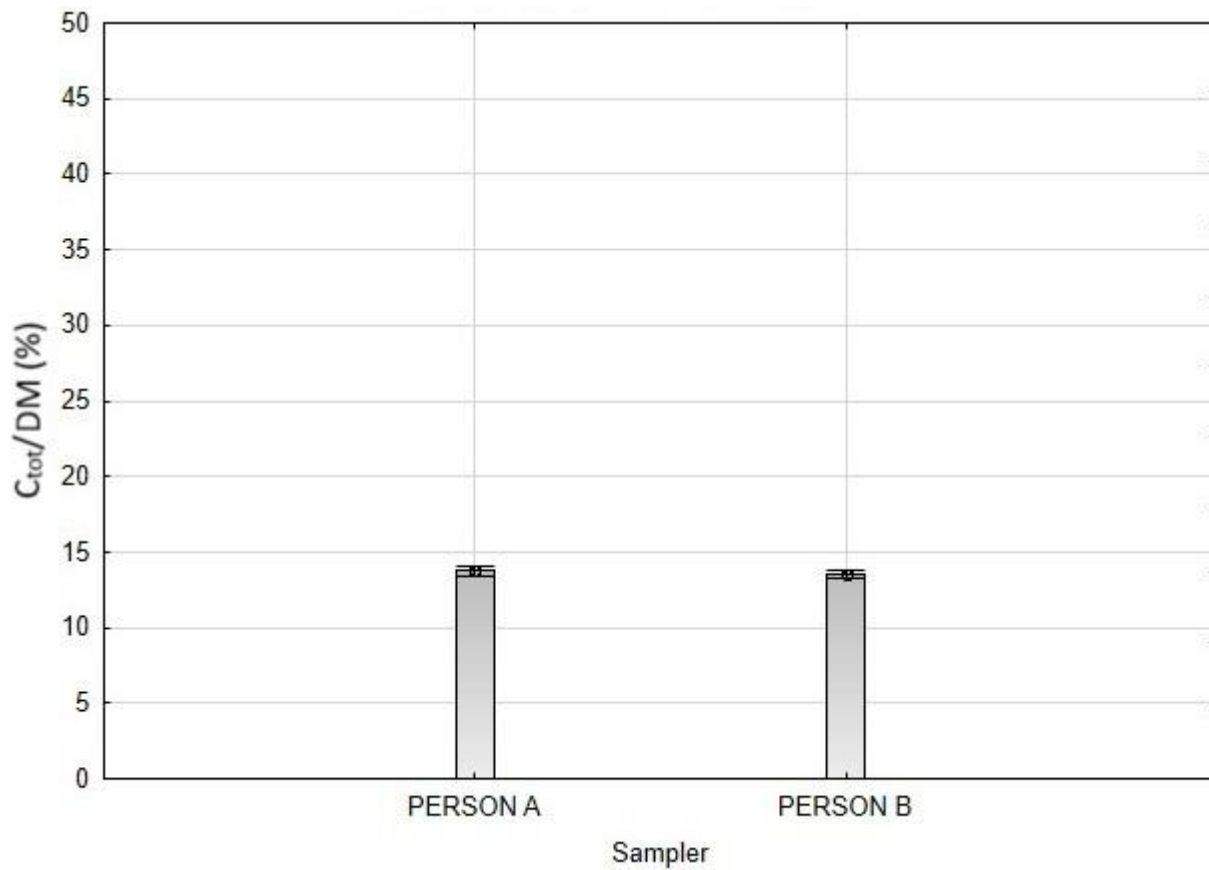
Sampler	N _{tot} /DM (%) (weighted average)	N _{tot} /DM (%) (SEM)	N _{tot} /DM (%) (-SEM)	N _{tot} /DM (%) (+SEM)	N
PERSON A	14,60200	0,363518	14,23848	14,96552	20
PERSON B	14,88200	0,326689	14,55531	15,20869	20
	P ₂ O ₅ tot/DM (%) (weighted average)	P ₂ O ₅ tot/DM (%) (SEM)	P ₂ O ₅ tot/DM (%) (-SEM)	P ₂ O ₅ tot/DM (%) (+SEM)	N
PERSON A	4,328000	0,289041	4,038959	4,617041	20
PERSON B	4,178500	0,253329	3,925171	4,431829	20
	K ₂ O _{tot} /DM (%) (weighted average)	K ₂ O _{tot} /DM (%) (SEM)	K ₂ O _{tot} /DM (%) (-SEM)	K ₂ O _{tot} /DM (%) (+SEM)	N
PERSON A	11,21950	0,523483	10,69602	11,74298	20
PERSON B	11,00050	0,404512	10,59599	11,40501	20

Note: SEM – Standard Error of the Mean

Tukey's Honest Significant Difference (HSD) test

Sampler	N _{tot} /DM (%) (weighted average)	1	2
PERSON A	14,60200	****	
PERSON B	14,88200	****	
Sampler	P ₂ O ₅ tot/DM (%) (weighted average)	1	2
PERSON A	4,328000	****	
PERSON B	4,178500	****	
Sampler	K ₂ O _{tot} /DM (%) (weighted average)	1	2
PERSON A	11,21950	****	
PERSON B	11,00050	****	

(b) C_{tot}



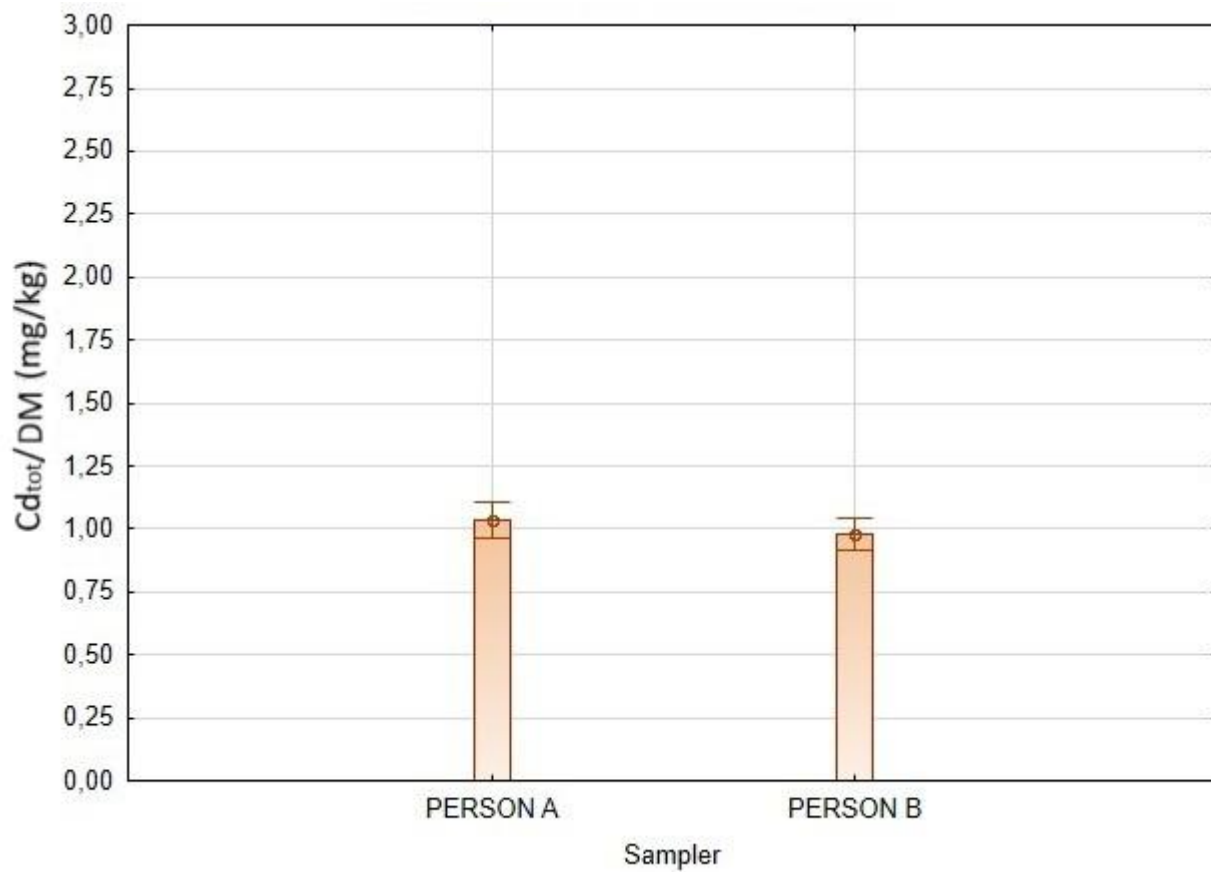
Sampler	C_{tot}/DM (%) (weighted average)	C_{tot}/DM (%) (SEM)	C_{tot}/DM (%) (-SEM)	C_{tot}/DM (%) (+SEM)	N
PERSON A	13,75350	0,354533	13,39897	14,10803	20
PERSON B	13,50800	0,237991	13,27001	13,74599	20

Note: SEM – Standard Error of the Mean

Tukey's Honest Significant Difference (HSD) test

Sampler	C_{tot}/DM (%) (weighted average)	1	2
PERSON A	13,75350	****	
PERSON B	13,50800	****	

(c) Cd



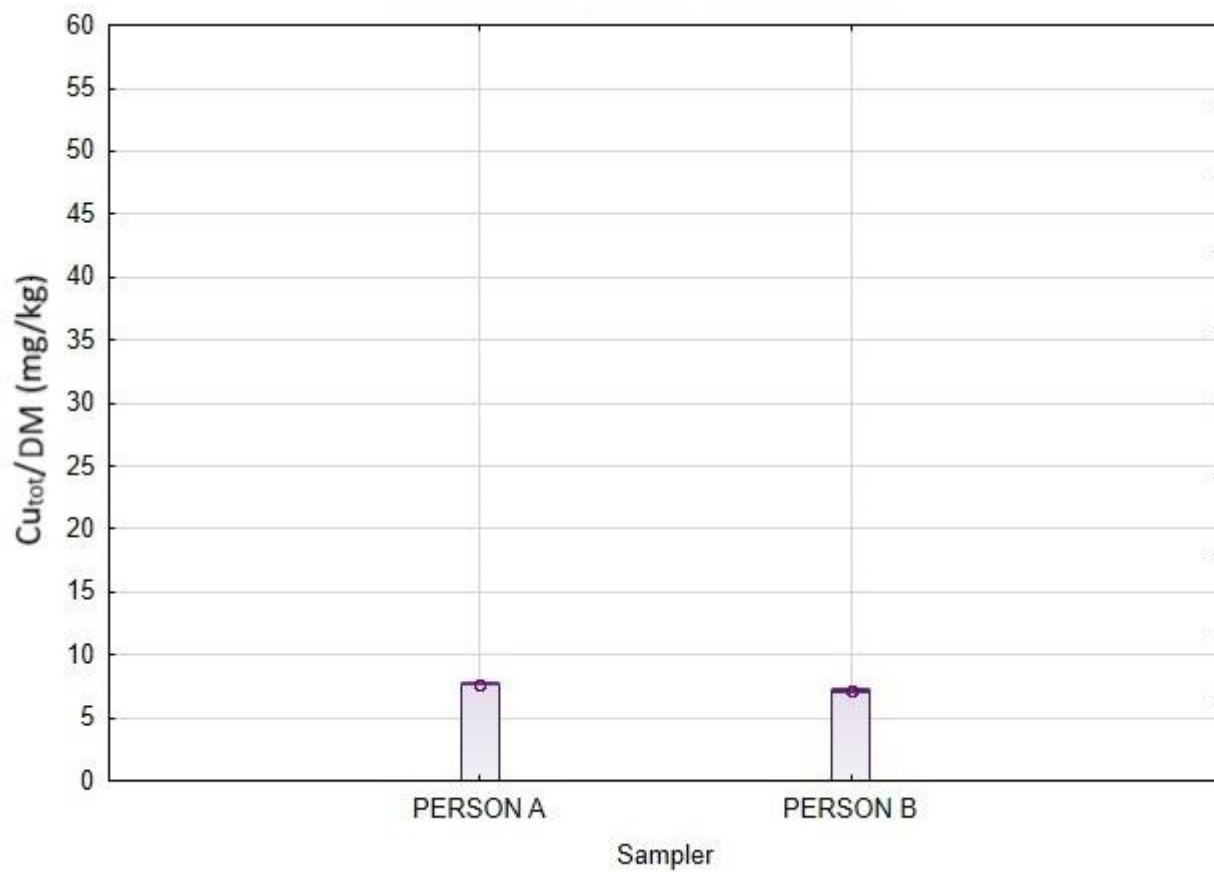
Sampler	Cd _{tot} /DM (mg/kg) (weighted average)	Cd _{tot} /DM (mg/kg) (SEM)	Cd _{tot} /DM (mg/kg) (-SEM)	Cd _{tot} /DM (mg/kg) (+SEM)	N
PERSON A	1,034470	0,071243	0,963227	1,105713	20
PERSON B	0,980355	0,061501	0,918854	1,041856	20

Note: SEM – Standard Error of the Mean

Tukey's Honest Significant Difference (HSD) test

Sampler	Cd _{tot} /DM (mg/kg) (weighted average)	1	2
PERSON A	1,034470	****	
PERSON B	0,980355	****	

(d) Cu



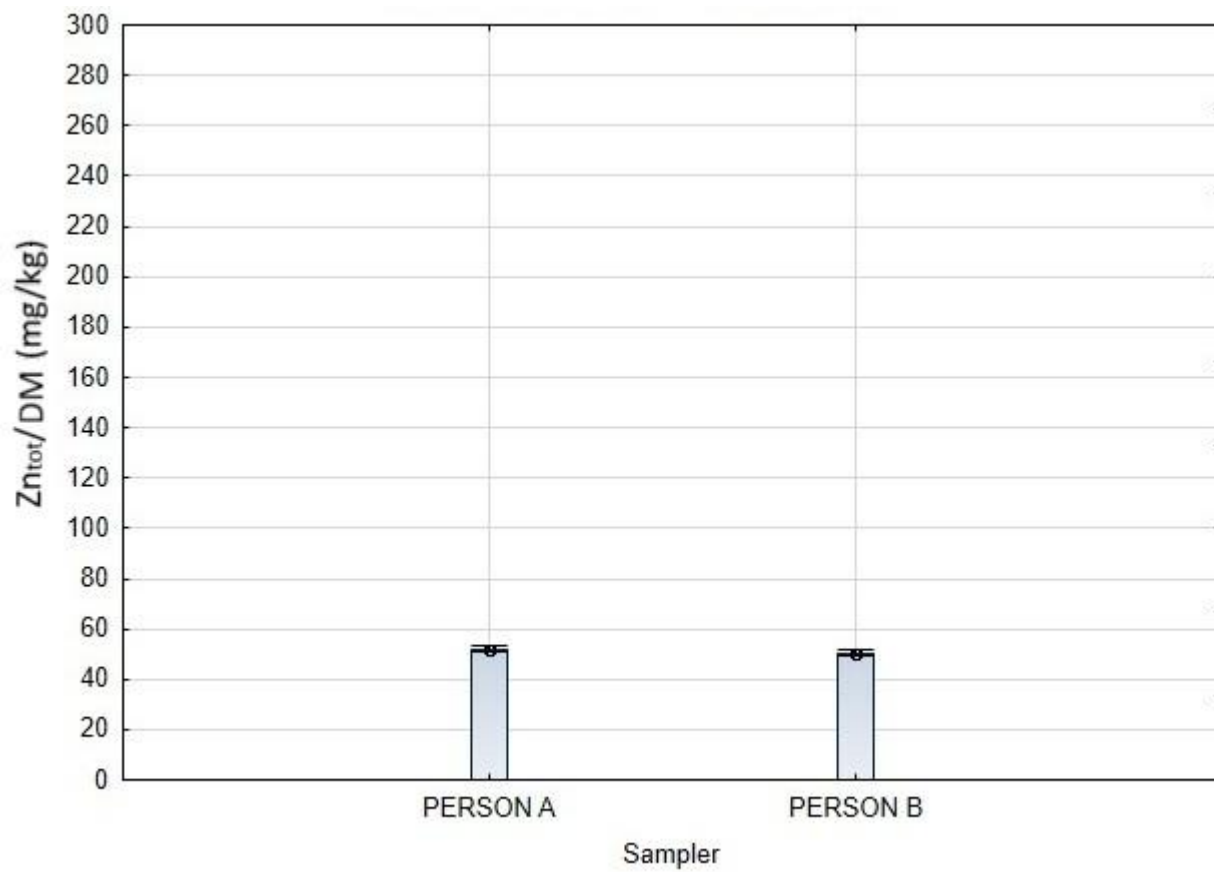
Sampler	Cu _{tot} /DM (mg/kg) (weighted average)	Cu _{tot} /DM (mg/kg) (SEM)	Cu _{tot} /DM (mg/kg) (-SEM)	Cu _{tot} /DM (mg/kg) (+SEM)	N
PERSON A	7,708150	0,101028	7,607122	7,809178	20
PERSON B	7,205950	0,140573	7,065377	7,346523	20

Note: SEM – Standard Error of the Mean

Tukey's Honest Significant Difference (HSD) test

Sampler	Cu _{tot} /DM (mg/kg) (weighted average)	1	2
PERSON A	7,708150		****
PERSON B	7,205950	****	

(e) Zn



Sampler	Zn _{tot} /DM (mg/kg) (weighted average)	Zn _{tot} /DM (mg/kg) (SEM)	Zn _{tot} /DM (mg/kg) (-SEM)	Zn _{tot} /DM (mg/kg) (+SEM)	N
PERSON A	52,17800	0,916342	51,26166	53,09434	20
PERSON B	50,48100	0,957510	49,52349	51,43851	20

Note: SEM – Standard Error of the Mean

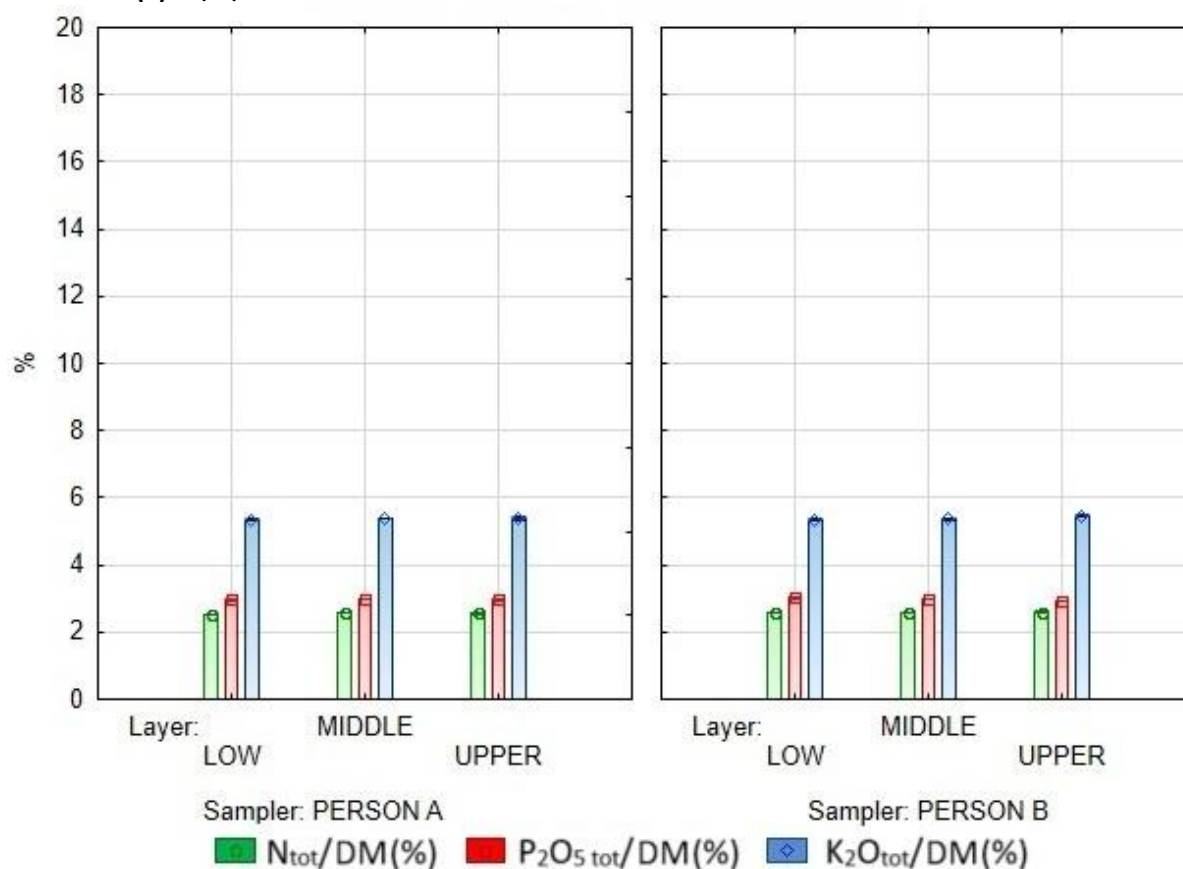
Tukey's Honest Significant Difference (HSD) test

Sampler	Zn _{tot} /DM (mg/kg) (weighted average)	1	2
PERSON A	52,17800	****	
PERSON B	50,48100	****	

11. Static sampling – layers of a cone

11.1. Dried pelleted manure – incremental samples

(a) N, P, K

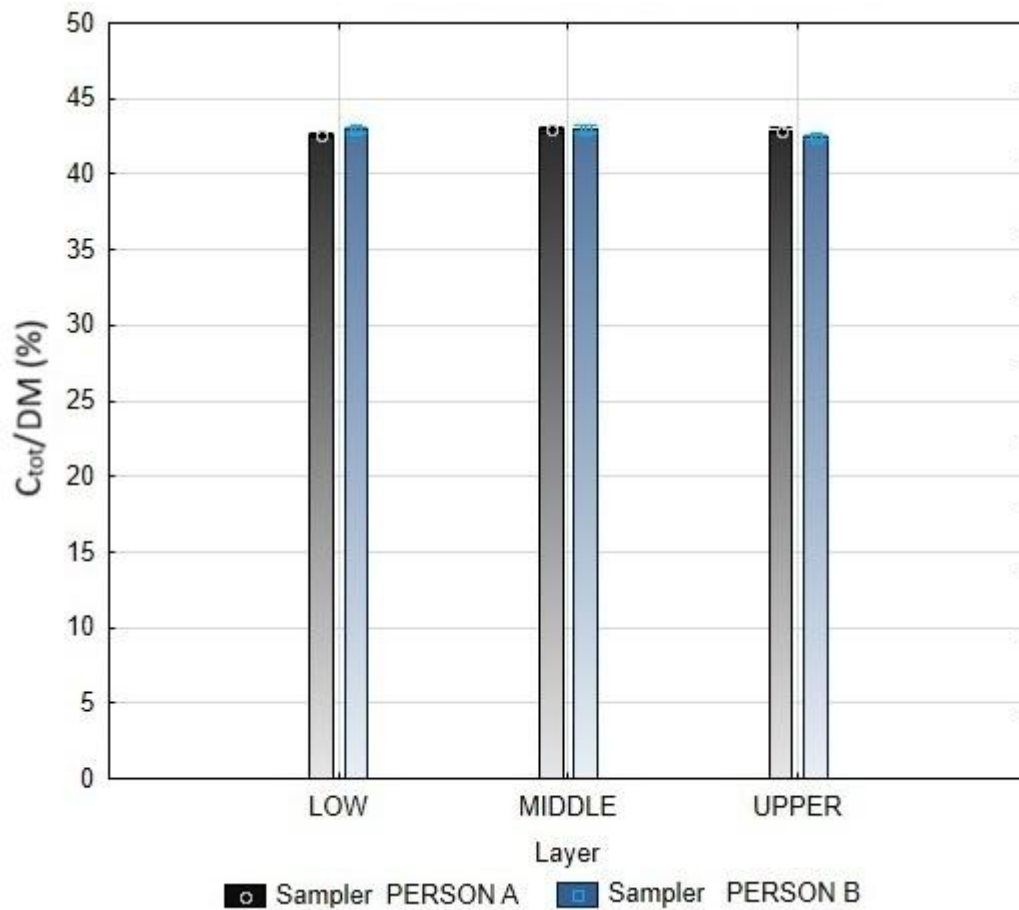


Sampler	Layer	N _{tot} /DM (%) (weighted average)	N _{tot} /DM (%) (SEM)	N _{tot} /DM (%) (-SEM)	N _{tot} /DM (%) (+SEM)	N
PERSON A	LOW	2,536000	0,007333	2,528667	2,543333	10
PERSON A	MIDDLE	2,571667	0,003073	2,568593	2,574740	6
PERSON A	UPPER	2,557500	0,020966	2,536534	2,578466	4
PERSON B	LOW	2,585000	0,010247	2,574753	2,595247	10
PERSON B	MIDDLE	2,570000	0,012111	2,557889	2,582111	6
PERSON B	UPPER	2,602500	0,009465	2,593035	2,611965	4
		P ₂ O ₅ _{tot} /DM (%) (weighted average)	P ₂ O ₅ _{tot} /DM (%) (SEM)	P ₂ O ₅ _{tot} /DM (%) (-SEM)	P ₂ O ₅ _{tot} /DM (%) (+SEM)	N
PERSON A	LOW	2,968000	0,013482	2,954518	2,981482	10
PERSON A	MIDDLE	2,996667	0,009545	2,987121	3,006212	6
PERSON A	UPPER	2,972500	0,023936	2,948564	2,996436	4
PERSON B	LOW	3,021000	0,016428	3,004572	3,037428	10
PERSON B	MIDDLE	2,996667	0,014530	2,982137	3,011196	6
PERSON B	UPPER	2,922500	0,020565	2,901935	2,943065	4
		K ₂ O _{tot} /DM (%) (weighted average)	K ₂ O _{tot} /DM (%) (SEM)	K ₂ O _{tot} /DM (%) (-SEM)	K ₂ O _{tot} /DM (%) (+SEM)	N
PERSON A	LOW	5,341000	0,028184	5,312816	5,369184	10
PERSON A	MIDDLE	5,375000	0,019451	5,355549	5,394451	6
PERSON A	UPPER	5,390000	0,060139	5,329861	5,450139	4
PERSON B	LOW	5,337000	0,021242	5,315758	5,358242	10
PERSON B	MIDDLE	5,368333	0,029599	5,338734	5,397933	6
PERSON B	UPPER	5,450000	0,030277	5,419723	5,480277	4

Note: SEM – Standard Error of the Mean

Tukey's Honest Significant Difference (HSD) test

Sampler	Layer	N_{tot}/DM (%) (weighted average)	1	2
PERSON A	LOW	2,536000		****
PERSON A	MIDDLE	2,571667	****	****
PERSON A	UPPER	2,557500	****	****
PERSON B	LOW	2,585000	****	
PERSON B	MIDDLE	2,570000	****	****
PERSON B	UPPER	2,602500	****	
Sampler		P₂O_{5 tot}/DM (%) (weighted average)	1	2
PERSON A	LOW	2,968000	****	****
PERSON A	MIDDLE	2,996667	****	****
PERSON A	UPPER	2,972500	****	****
PERSON B	LOW	3,021000		****
PERSON B	MIDDLE	2,996667	****	****
PERSON B	UPPER	2,922500	****	
Sampler		K₂O_{tot}/DM (%) (weighted average)	1	2
PERSON A	LOW	5,341000	****	
PERSON A	MIDDLE	5,375000	****	
PERSON A	UPPER	5,390000	****	
PERSON B	LOW	5,337000	****	
PERSON B	MIDDLE	5,368333	****	
PERSON B	UPPER	5,450000	****	

(b) C_{tot} 

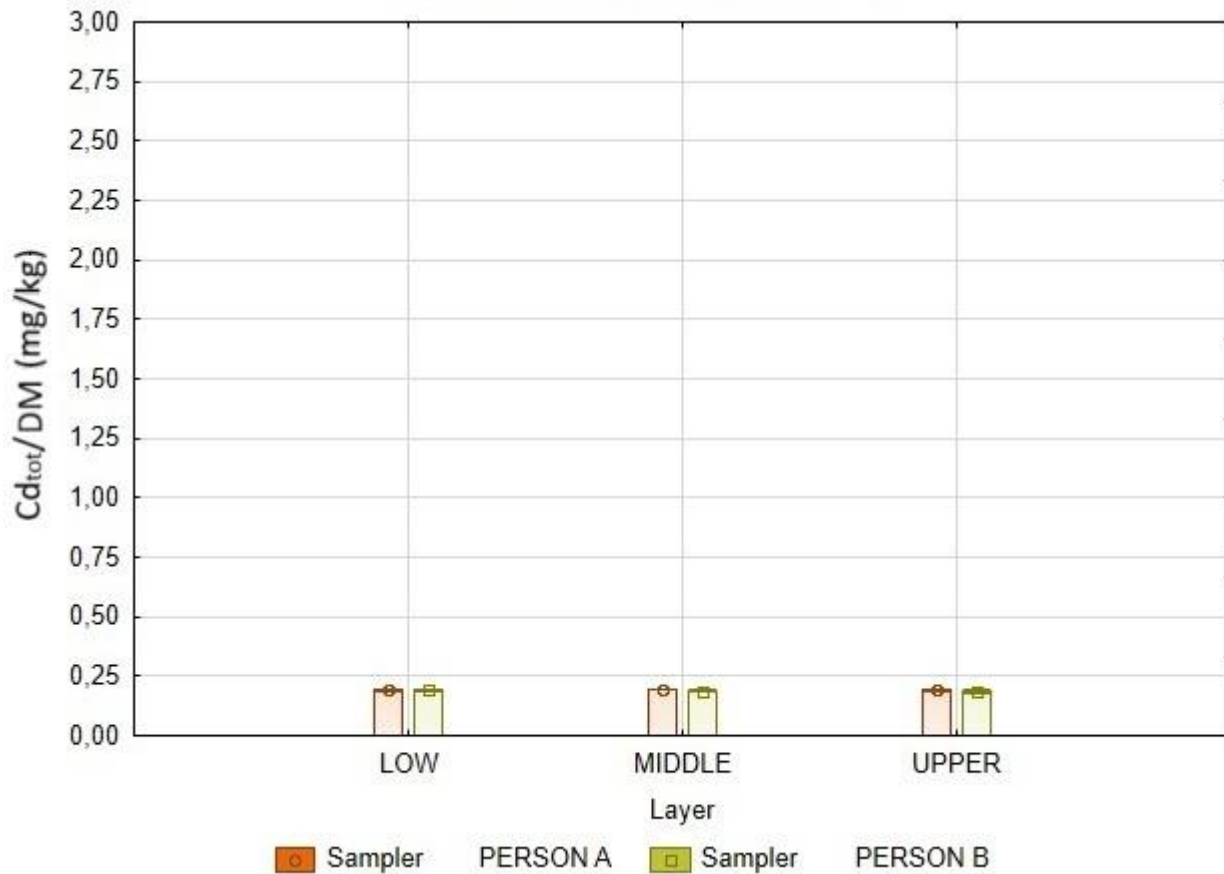
Sampler	Layer	C_{tot}/DM (%) (weighted average)	C_{tot}/DM (%) (SEM)	C_{tot}/DM (%) (-SEM)	C_{tot}/DM (%) (+SEM)	N
PERSON A	LOW	42,56900	0,128551	42,44045	42,69755	10
PERSON A	MIDDLE	42,95333	0,198975	42,75436	43,15231	6
PERSON A	UPPER	42,89000	0,210119	42,67988	43,10012	4
PERSON B	LOW	42,97200	0,195265	42,77673	43,16727	10
PERSON B	MIDDLE	42,96333	0,221083	42,74225	43,18442	6
PERSON B	UPPER	42,46250	0,096036	42,36646	42,55854	4

Note: SEM – Standard Error of the Mean

Tukey's Honest Significant Difference (HSD) test

Sampler	Layer	C_{tot}/DM (%) (weighted average)	1	2
PERSON A	LOW	42,56900	****	
PERSON A	MIDDLE	42,95333	****	
PERSON A	UPPER	42,89000	****	
PERSON B	LOW	42,97200	****	
PERSON B	MIDDLE	42,96333	****	
PERSON B	UPPER	42,46250	****	

(c) Cd



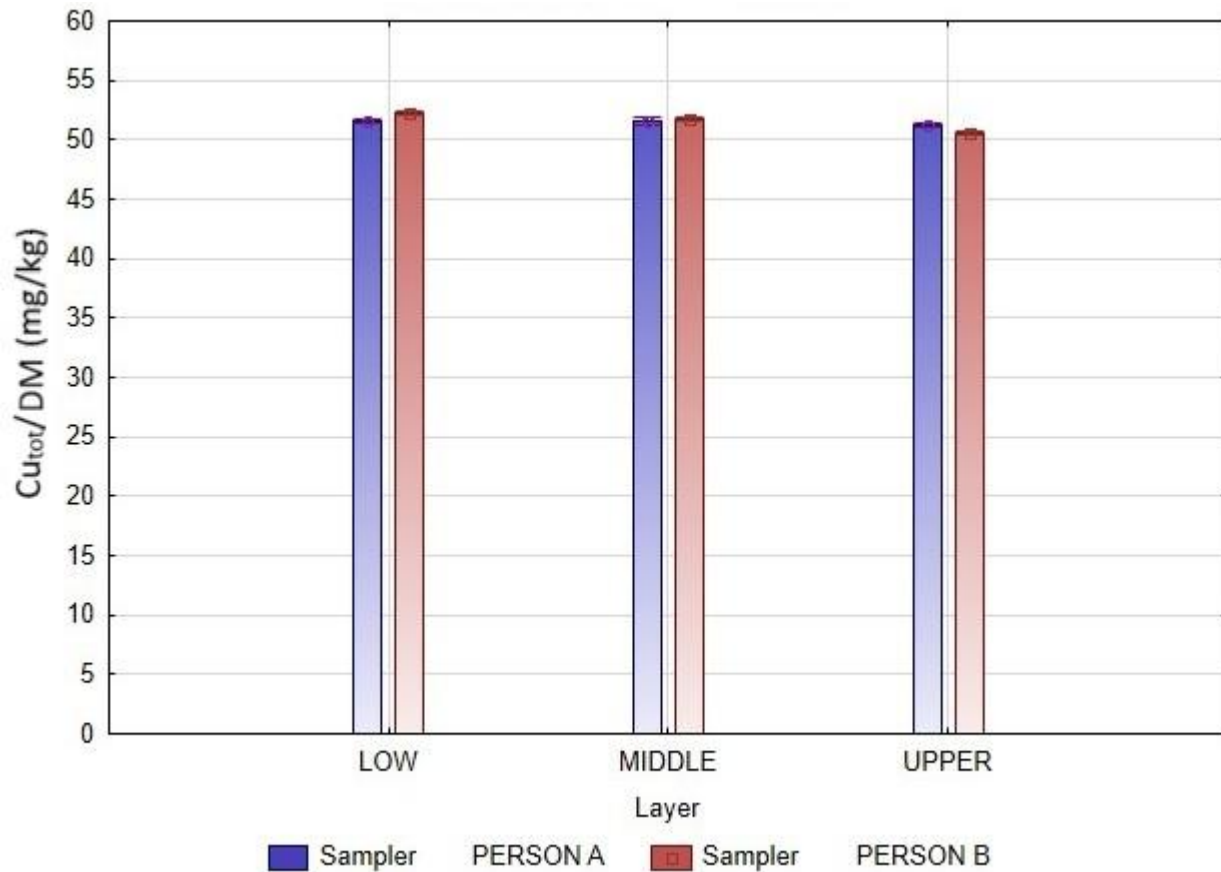
Sampler	Layer	Cd _{tot} /DM (mg/kg) (weighted average)	Cd _{tot} /DM (mg/kg) (SEM)	Cd _{tot} /DM (mg/kg) (-SEM)	Cd _{tot} /DM (mg/kg) (+SEM)	N
PERSON A	LOW	0,190970	0,002554	0,188416	0,193524	10
PERSON A	MIDDLE	0,193717	0,002291	0,191425	0,196008	6
PERSON A	UPPER	0,191875	0,004016	0,187859	0,195891	4
PERSON B	LOW	0,191140	0,002065	0,189075	0,193205	10
PERSON B	MIDDLE	0,190300	0,004538	0,185762	0,194838	6
PERSON B	UPPER	0,187150	0,005340	0,181810	0,192490	4

Note: SEM – Standard Error of the Mean

Tukey's Honest Significant Difference (HSD) test

Sampler	Layer	Cd _{tot} /DM (mg/kg) (weighted average)	1	2
PERSON A	LOW	0,190970	****	
PERSON A	MIDDLE	0,193717	****	
PERSON A	UPPER	0,191875	****	
PERSON B	LOW	0,191140	****	
PERSON B	MIDDLE	0,190300	****	
PERSON B	UPPER	0,187150	****	

(d) Cu



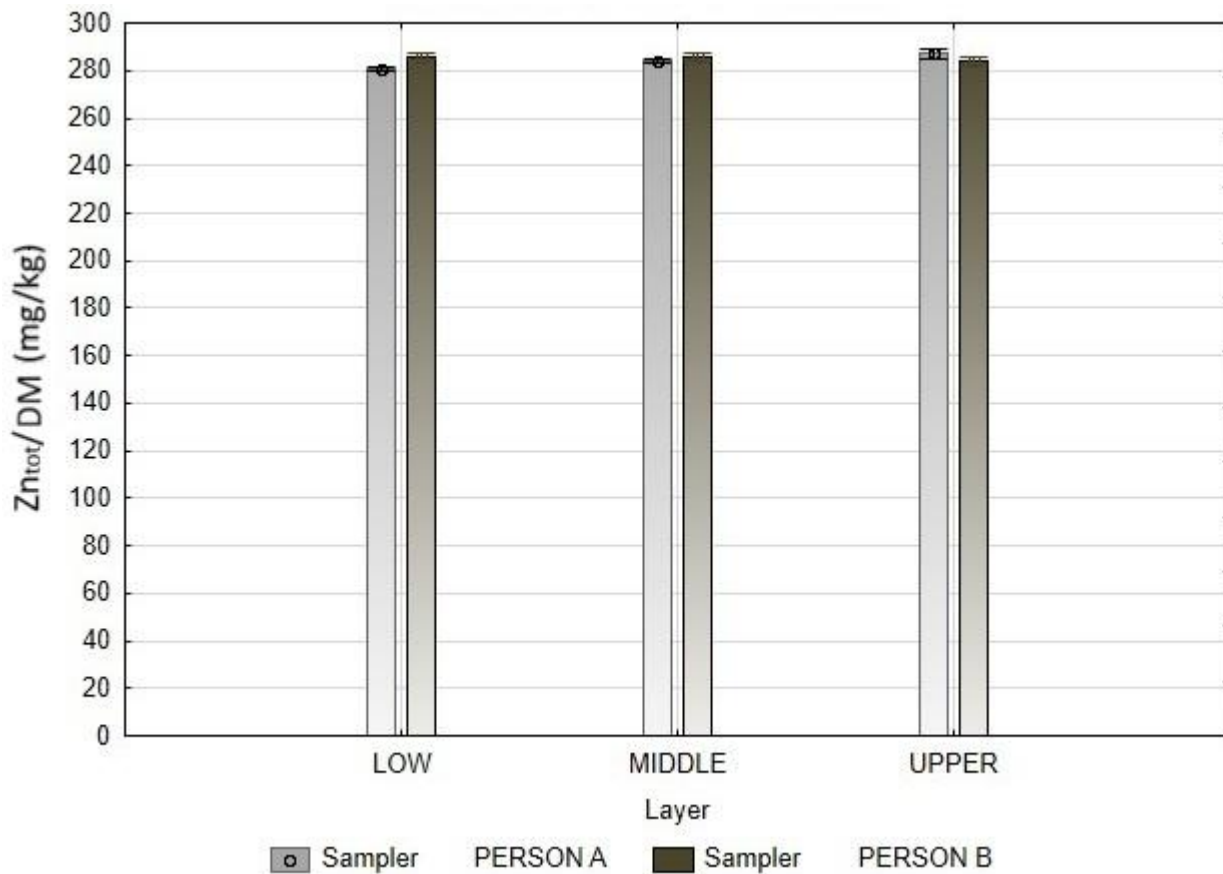
Sampler	Layer	Cu_{tot}/DM (mg/kg) (weighted average)	Cu_{tot}/DM (mg/kg) (SEM)	Cu_{tot}/DM (mg/kg) (-SEM)	Cu_{tot}/DM (mg/kg) (+SEM)	N
PERSON A	LOW	51,59000	0,228235	51,36177	51,81823	10
PERSON A	MIDDLE	51,56833	0,287558	51,28078	51,85589	6
PERSON A	UPPER	51,21750	0,213009	51,00449	51,43051	4
PERSON B	LOW	52,31400	0,199884	52,11412	52,51388	10
PERSON B	MIDDLE	51,73833	0,203116	51,53522	51,94145	6
PERSON B	UPPER	50,58250	0,194481	50,38802	50,77698	4

Note: SEM – Standard Error of the Mean

Tukey's Honest Significant Difference (HSD) test

Sampler	Layer	Cu_{tot}/DM (mg/kg) (weighted average)	1	2
PERSON A	LOW	51,59000	****	****
PERSON A	MIDDLE	51,56833	****	****
PERSON A	UPPER	51,21750	****	****
PERSON B	LOW	52,31400		****
PERSON B	MIDDLE	51,73833	****	****
PERSON B	UPPER	50,58250	****	

(e) Zn



Sampler	Layer	Zn _{tot} /DM (mg/kg) (weighted average)	Zn _{tot} /DM (mg/kg) (SEM)	Zn _{tot} /DM (mg/kg) (-SEM)	Zn _{tot} /DM (mg/kg) (+SEM)	N
PERSON A	LOW	280,6300	1,176723	279,4533	281,8067	10
PERSON A	MIDDLE	284,1667	1,102018	283,0646	285,2687	6
PERSON A	UPPER	287,1750	2,277929	284,8971	289,4529	4
PERSON B	LOW	286,0500	1,516813	284,5332	287,5668	10
PERSON B	MIDDLE	285,5333	1,573460	283,9599	287,1068	6
PERSON B	UPPER	284,0500	1,460879	282,5891	285,5109	4

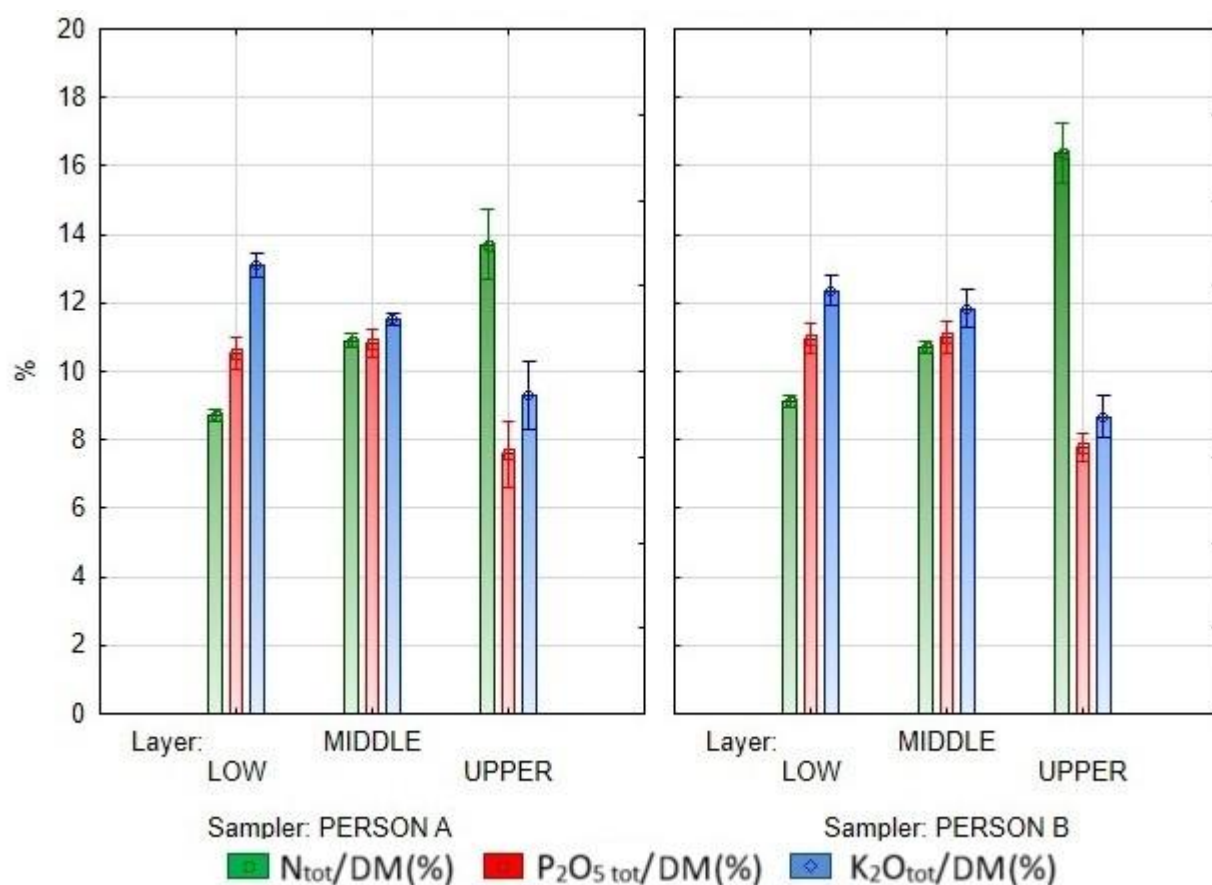
Note: SEM – Standard Error of the Mean

Tukey's Honest Significant Difference (HSD) test

Sampler	Layer	Zn _{tot} /DM (mg/kg) (weighted average)	1	2
PERSON A	LOW	280,6300	****	
PERSON A	MIDDLE	284,1667	****	****
PERSON A	UPPER	287,1750	****	****
PERSON B	LOW	286,0500		****
PERSON B	MIDDLE	285,5333	****	****
PERSON B	UPPER	284,0500	****	****

11.2. Blend 1 – incremental samples

(a) N, P, K

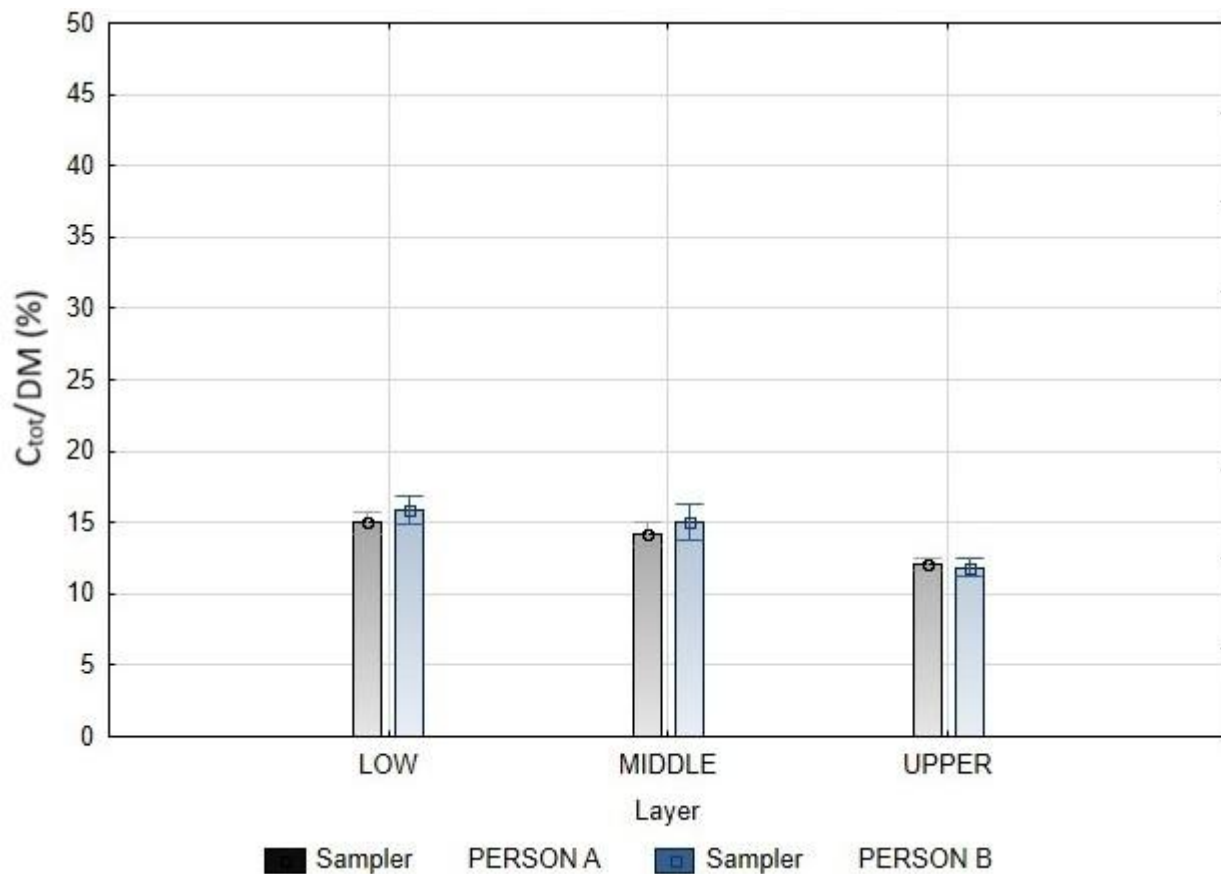


Sampler	Layer	$N_{\text{tot}}/\text{DM}(\%)$ (weighted average)	$N_{\text{tot}}/\text{DM}(\%)$ (SEM)	$N_{\text{tot}}/\text{DM}(\%)$ (-SEM)	$N_{\text{tot}}/\text{DM}(\%)$ (+SEM)	N
PERSON A	LOW	8,69700	0,177520	8,51948	8,87452	10
PERSON A	MIDDLE	10,88833	0,209562	10,67877	11,09790	6
PERSON A	UPPER	13,71250	1,031660	12,68084	14,74416	4
PERSON B	LOW	9,12800	0,181633	8,94637	9,30963	10
PERSON B	MIDDLE	10,70000	0,190928	10,50907	10,89093	6
PERSON B	UPPER	16,38750	0,870626	15,51687	17,25813	4
		$P_2O_5 \text{ tot}/\text{DM}(\%)$ (weighted average)	$P_2O_5 \text{ tot}/\text{DM}(\%)$ (SEM)	$P_2O_5 \text{ tot}/\text{DM}(\%)$ (-SEM)	$P_2O_5 \text{ tot}/\text{DM}(\%)$ (+SEM)	N
PERSON A	LOW	10,53200	0,470371	10,06163	11,00237	10
PERSON A	MIDDLE	10,83167	0,412282	10,41939	11,24395	6
PERSON A	UPPER	7,58500	0,979868	6,60513	8,56487	4
PERSON B	LOW	10,96600	0,413885	10,55212	11,37988	10
PERSON B	MIDDLE	10,99500	0,461077	10,53392	11,45608	6
PERSON B	UPPER	7,77250	0,389816	7,38268	8,16232	4
		$K_2O_{\text{tot}}/\text{DM}(\%)$ (weighted average)	$K_2O_{\text{tot}}/\text{DM}(\%)$ (SEM)	$K_2O_{\text{tot}}/\text{DM}(\%)$ (-SEM)	$K_2O_{\text{tot}}/\text{DM}(\%)$ (+SEM)	N
PERSON A	LOW	13,08600	0,337541	12,74846	13,42354	10
PERSON A	MIDDLE	11,53333	0,173852	11,35948	11,70719	6
PERSON A	UPPER	9,30750	0,987888	8,31961	10,29539	4
PERSON B	LOW	12,35900	0,440740	11,91826	12,79974	10
PERSON B	MIDDLE	11,83667	0,536157	11,30051	12,37282	6
PERSON B	UPPER	8,67000	0,619233	8,05077	9,28923	4

Note: SEM – Standard Error of the Mean

Tukey's Honest Significant Difference (HSD) test

Sampler	Layer	N_{tot}/DM (%) (weighted average)	1	2	3	4
PERSON A	LOW	8,69700	****			
PERSON A	MIDDLE	10,88833		****		
PERSON A	UPPER	13,71250			****	
PERSON B	LOW	9,12800	****			
PERSON B	MIDDLE	10,70000		****		
PERSON B	UPPER	16,38750				****
Sampler	Layer	P₂O_{5 tot}/DM (%) (weighted average)	1	2	3	4
PERSON A	LOW	10,53200	****			
PERSON A	MIDDLE	10,83167	****			
PERSON A	UPPER	7,58500		****		
PERSON B	LOW	10,96600	****			
PERSON B	MIDDLE	10,99500	****			
PERSON B	UPPER	7,77250		****		
Sampler	Layer	K₂O_{tot}/DM (%) (weighted average)	1	2	3	4
PERSON A	LOW	13,08600	****			
PERSON A	MIDDLE	11,53333	****		****	
PERSON A	UPPER	9,30750		****	****	
PERSON B	LOW	12,35900	****			
PERSON B	MIDDLE	11,83667	****			
PERSON B	UPPER	8,67000		****		

(b) C_{tot} 

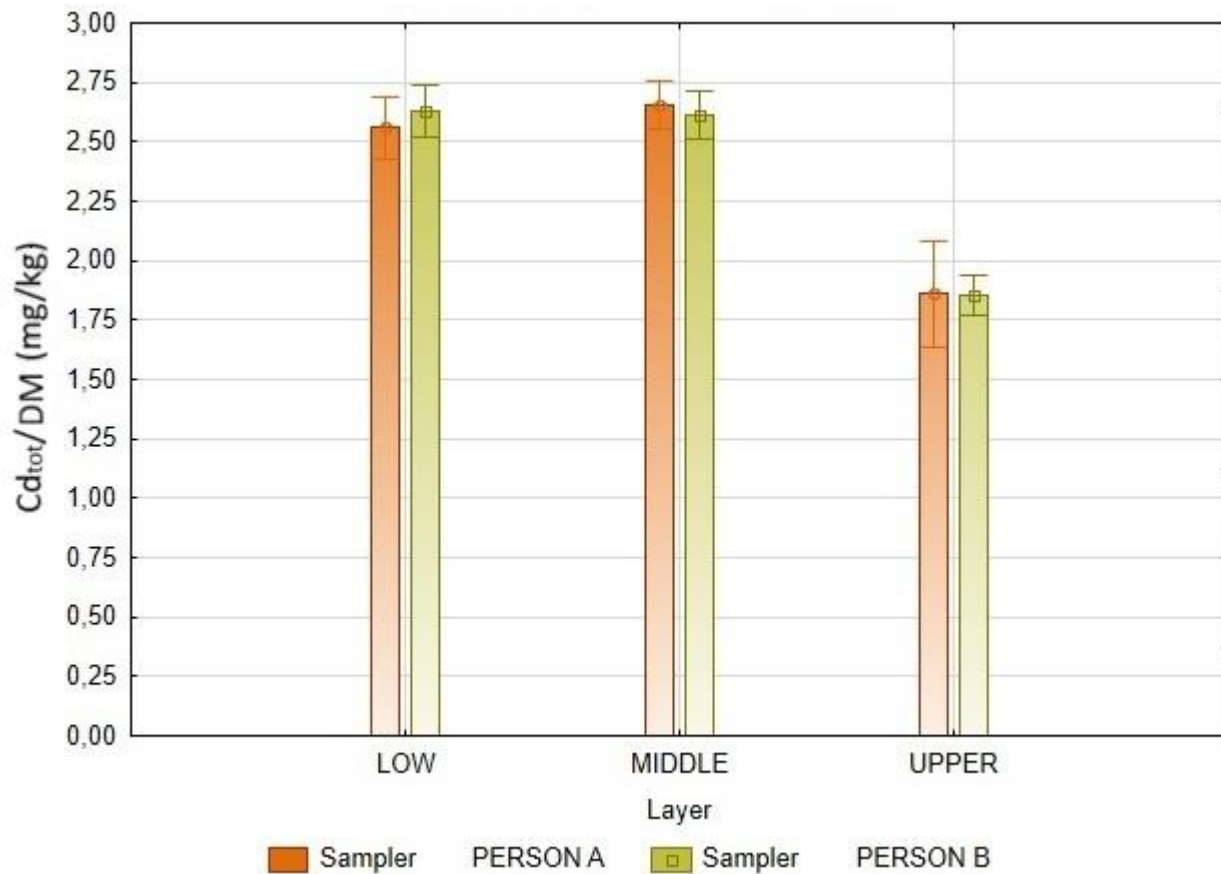
Sampler	Layer	C_{tot}/DM (%) (weighted average)	C_{tot}/DM (%) (SEM)	C_{tot}/DM (%) (-SEM)	C_{tot}/DM (%) (+SEM)	N
PERSON A	LOW	14,96700	0,832849	14,13415	15,79985	10
PERSON A	MIDDLE	14,17833	0,828064	13,35027	15,00640	6
PERSON A	UPPER	12,09750	0,419312	11,67819	12,51681	4
PERSON B	LOW	15,93200	0,984557	14,94744	16,91656	10
PERSON B	MIDDLE	15,02000	1,288919	13,73108	16,30892	6
PERSON B	UPPER	11,86500	0,576520	11,28848	12,44152	4

Note: SEM – Standard Error of the Mean

Tukey's Honest Significant Difference (HSD) test

Sampler	Layer	C_{tot}/DM (%) (weighted average)	1	2
PERSON A	LOW	14,96700	****	
PERSON A	MIDDLE	14,17833	****	
PERSON A	UPPER	12,09750	****	
PERSON B	LOW	15,93200	****	
PERSON B	MIDDLE	15,02000	****	
PERSON B	UPPER	11,86500	****	

(c) Cd



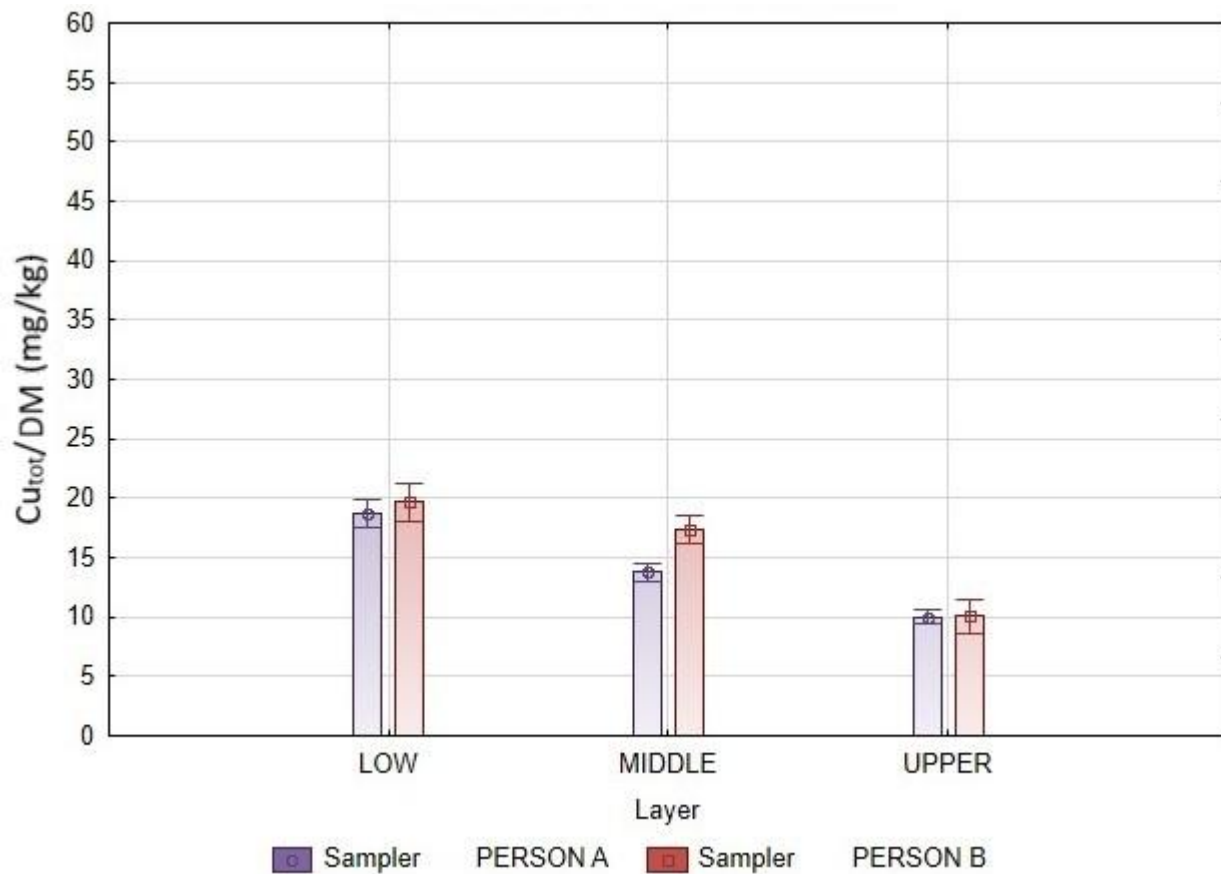
Sampler	Layer	Cd _{tot} /DM (mg/kg) (weighted average)	Cd _{tot} /DM (mg/kg) (SEM)	Cd _{tot} /DM (mg/kg) (-SEM)	Cd _{tot} /DM (mg/kg) (+SEM)	N
PERSON A	LOW	2,558500	0,129590	2,428910	2,688090	10
PERSON A	MIDDLE	2,656167	0,101546	2,554621	2,757713	6
PERSON A	UPPER	1,859500	0,226390	1,633110	2,085890	4
PERSON B	LOW	2,627300	0,109791	2,517509	2,737091	10
PERSON B	MIDDLE	2,613000	0,104929	2,508071	2,717929	6
PERSON B	UPPER	1,851500	0,084893	1,766607	1,936393	4

Note: SEM – Standard Error of the Mean

Tukey's Honest Significant Difference (HSD) test

Sampler	Layer	Cd _{tot} /DM (mg/kg) (weighted average)	1	2
PERSON A	LOW	2,558500	****	
PERSON A	MIDDLE	2,656167	****	
PERSON A	UPPER	1,859500		****
PERSON B	LOW	2,627300	****	
PERSON B	MIDDLE	2,613000	****	
PERSON B	UPPER	1,851500		****

(d) Cu



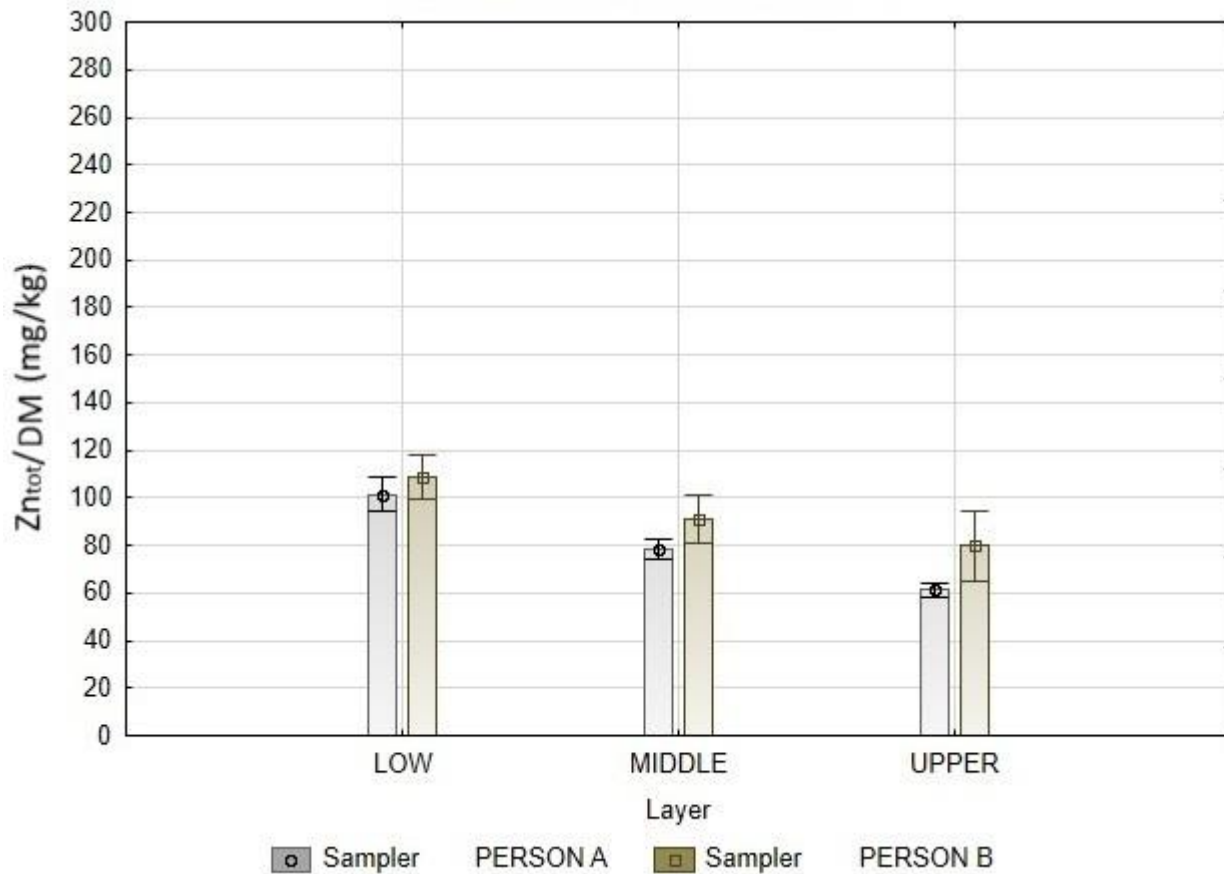
Sampler	Layer	Cu_{tot}/DM (mg/kg) (weighted average)	Cu_{tot}/DM (mg/kg) (SEM)	Cu_{tot}/DM (mg/kg) (-SEM)	Cu_{tot}/DM (mg/kg) (+SEM)	N
PERSON A	LOW	18,76200	1,206651	17,55535	19,96865	10
PERSON A	MIDDLE	13,77333	0,705477	13,06786	14,47881	6
PERSON A	UPPER	10,03200	0,615371	9,41663	10,64737	4
PERSON B	LOW	19,66800	1,626890	18,04111	21,29489	10
PERSON B	MIDDLE	17,41000	1,163263	16,24674	18,57326	6
PERSON B	UPPER	10,05000	1,395960	8,65404	11,44596	4

Note: SEM – Standard Error of the Mean

Tukey's Honest Significant Difference (HSD) test

Sampler	Layer	Cu_{tot}/DM (mg/kg) (weighted average)	1	2	3
PERSON A	LOW	18,76200		****	****
PERSON A	MIDDLE	13,77333	****	****	
PERSON A	UPPER	10,03200	****		
PERSON B	LOW	19,66800			****
PERSON B	MIDDLE	17,41000		****	****
PERSON B	UPPER	10,05000	****		

(e) Zn



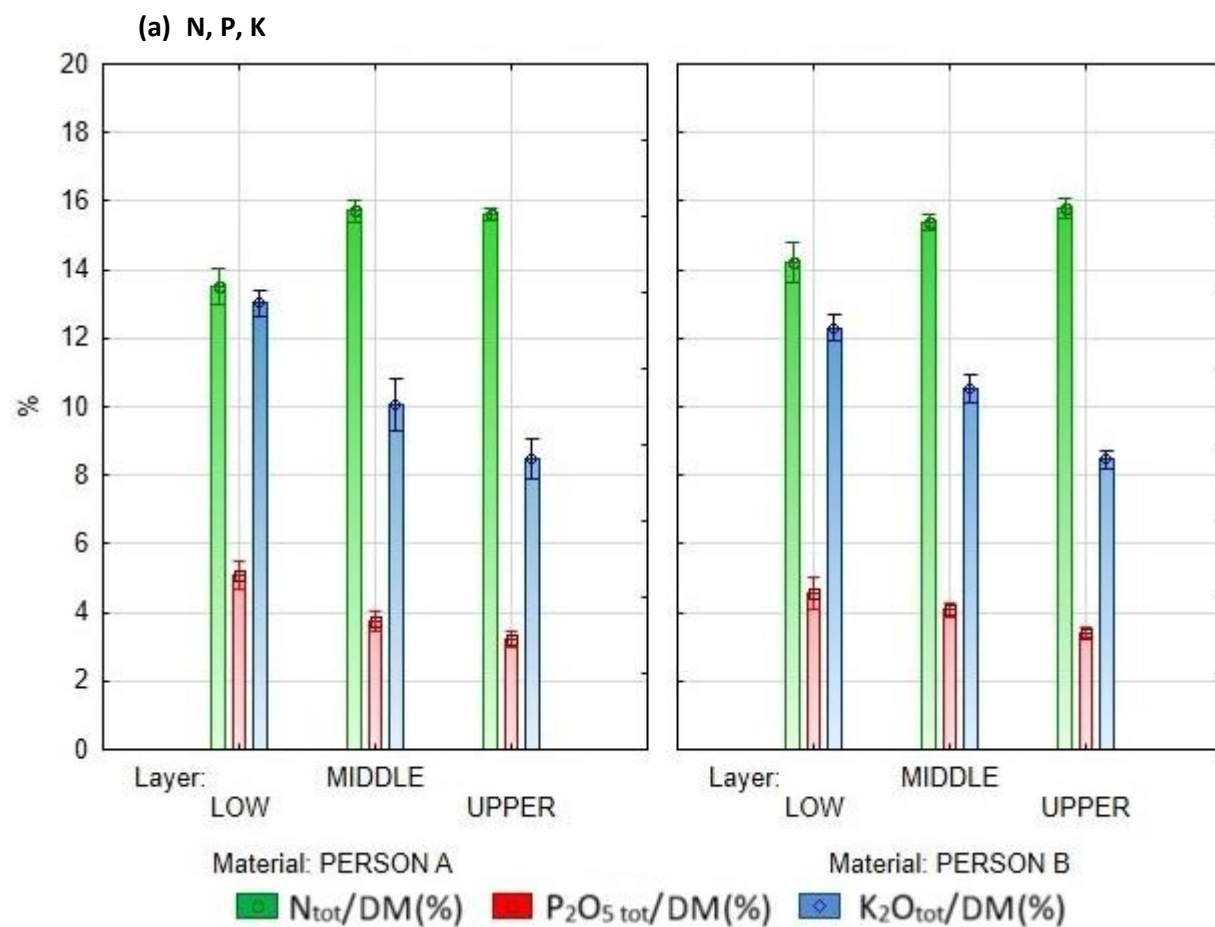
Sampler	Layer	Zn _{tot} /DM (mg/kg) (weighted average)	Zn _{tot} /DM (mg/kg) (SEM)	Zn _{tot} /DM (mg/kg) (-SEM)	Zn _{tot} /DM (mg/kg) (+SEM)	N
PERSON A	LOW	101,5380	7,24925	94,28875	108,7873	10
PERSON A	MIDDLE	78,7367	4,31776	74,41891	83,0544	6
PERSON A	UPPER	61,3075	2,74157	58,56593	64,0491	4
PERSON B	LOW	109,0000	9,14713	99,85287	118,1471	10
PERSON B	MIDDLE	90,9333	9,94387	80,98947	100,8772	6
PERSON B	UPPER	79,7850	14,73251	65,05249	94,5175	4

Note: SEM – Standard Error of the Mean

Tukey's Honest Significant Difference (HSD) test

Sampler	Layer	Zn _{tot} /DM (mg/kg) (weighted average)	1	2
PERSON A	LOW	101,5380	****	****
PERSON A	MIDDLE	78,7367	****	****
PERSON A	UPPER	61,3075	****	
PERSON B	LOW	109,0000		****
PERSON B	MIDDLE	90,9333	****	****
PERSON B	UPPER	79,7850	****	****

11.3. Blend 2 – incremental samples

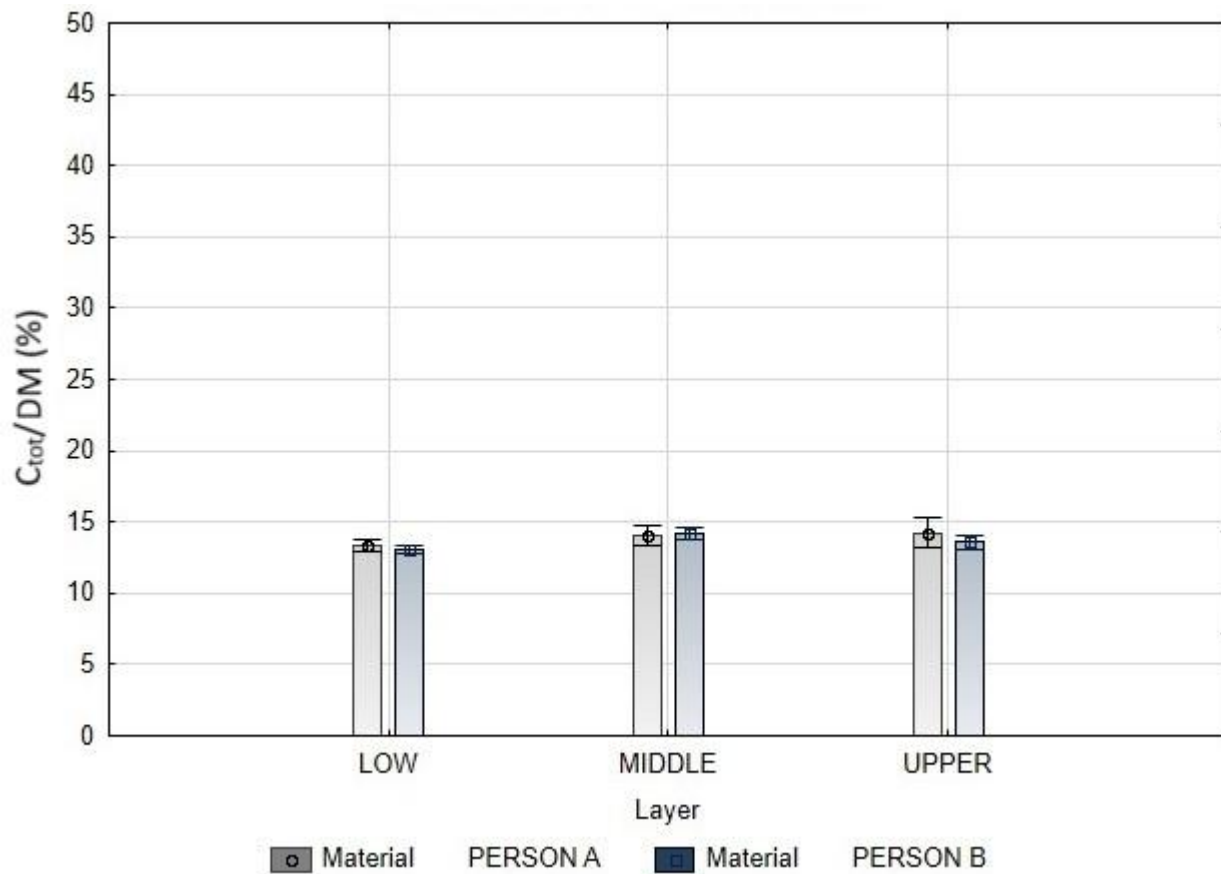


Sampler	Layer	N _{tot} /DM (%) (weighted average)	N _{tot} /DM (%) (SEM)	N _{tot} /DM (%) (-SEM)	N _{tot} /DM (%) (+SEM)	N
PERSON A	LOW	13,51600	0,506564	13,00944	14,02256	10
PERSON A	MIDDLE	15,72000	0,324438	15,39556	16,04444	6
PERSON A	UPPER	15,64000	0,173061	15,46694	15,81306	4
PERSON B	LOW	14,22000	0,566908	13,65309	14,78691	10
PERSON B	MIDDLE	15,38167	0,210799	15,17087	15,59247	6
PERSON B	UPPER	15,78750	0,307933	15,47957	16,09543	4
Sampler	Layer	P ₂ O _{5 tot} /DM (%) (weighted average)	P ₂ O _{5 tot} /DM (%) (SEM)	P ₂ O _{5 tot} /DM (%) (-SEM)	P ₂ O _{5 tot} /DM (%) (+SEM)	N
PERSON A	LOW	5,113000	0,415168	4,697832	5,528168	10
PERSON A	MIDDLE	3,755000	0,286807	3,468193	4,041807	6
PERSON A	UPPER	3,225000	0,252933	2,972067	3,477933	4
PERSON B	LOW	4,541000	0,461231	4,079769	5,002231	10
PERSON B	MIDDLE	4,090000	0,201031	3,888969	4,291031	6
PERSON B	UPPER	3,405000	0,151079	3,253921	3,556079	4
Sampler	Layer	K ₂ O _{tot} /DM (%) (weighted average)	K ₂ O _{tot} /DM (%) (SEM)	K ₂ O _{tot} /DM (%) (-SEM)	K ₂ O _{tot} /DM (%) (+SEM)	N
PERSON A	LOW	13,02600	0,366585	12,65941	13,39259	10
PERSON A	MIDDLE	10,05000	0,744240	9,30576	10,79424	6
PERSON A	UPPER	8,45750	0,582099	7,87540	9,03960	4
PERSON B	LOW	12,30200	0,362433	11,93957	12,66443	10
PERSON B	MIDDLE	10,52000	0,426708	10,09329	10,94671	6
PERSON B	UPPER	8,46750	0,274784	8,19272	8,74228	4

Note: SEM – Standard Error of the Mean

Tukey's Honest Significant Difference (HSD) test

Sampler	Layer	N_{tot}/DM (%) (weighted average)	1	2	3	4
PERSON A	LOW	13,51600	****			
PERSON A	MIDDLE	15,72000		****		
PERSON A	UPPER	15,64000	****	****		
PERSON B	LOW	14,22000	****	****		
PERSON B	MIDDLE	15,38167	****	****		
PERSON B	UPPER	15,78750	****	****		
Sampler	Layer	P₂O_{5 tot}/DM (%) (weighted average)	1	2	3	4
PERSON A	LOW	5,113000	****			
PERSON A	MIDDLE	3,755000	****			
PERSON A	UPPER	3,225000	****			
PERSON B	LOW	4,541000	****			
PERSON B	MIDDLE	4,090000	****			
PERSON B	UPPER	3,405000	****			
Sampler	Layer	K₂O_{tot}/DM (%) (weighted average)	1	2	3	4
PERSON A	LOW	13,02600			****	
PERSON A	MIDDLE	10,05000	****			
PERSON A	UPPER	8,45750	****			
PERSON B	LOW	12,30200		****	****	
PERSON B	MIDDLE	10,52000	****	****		
PERSON B	UPPER	8,46750	****			

(b) C_{tot} 

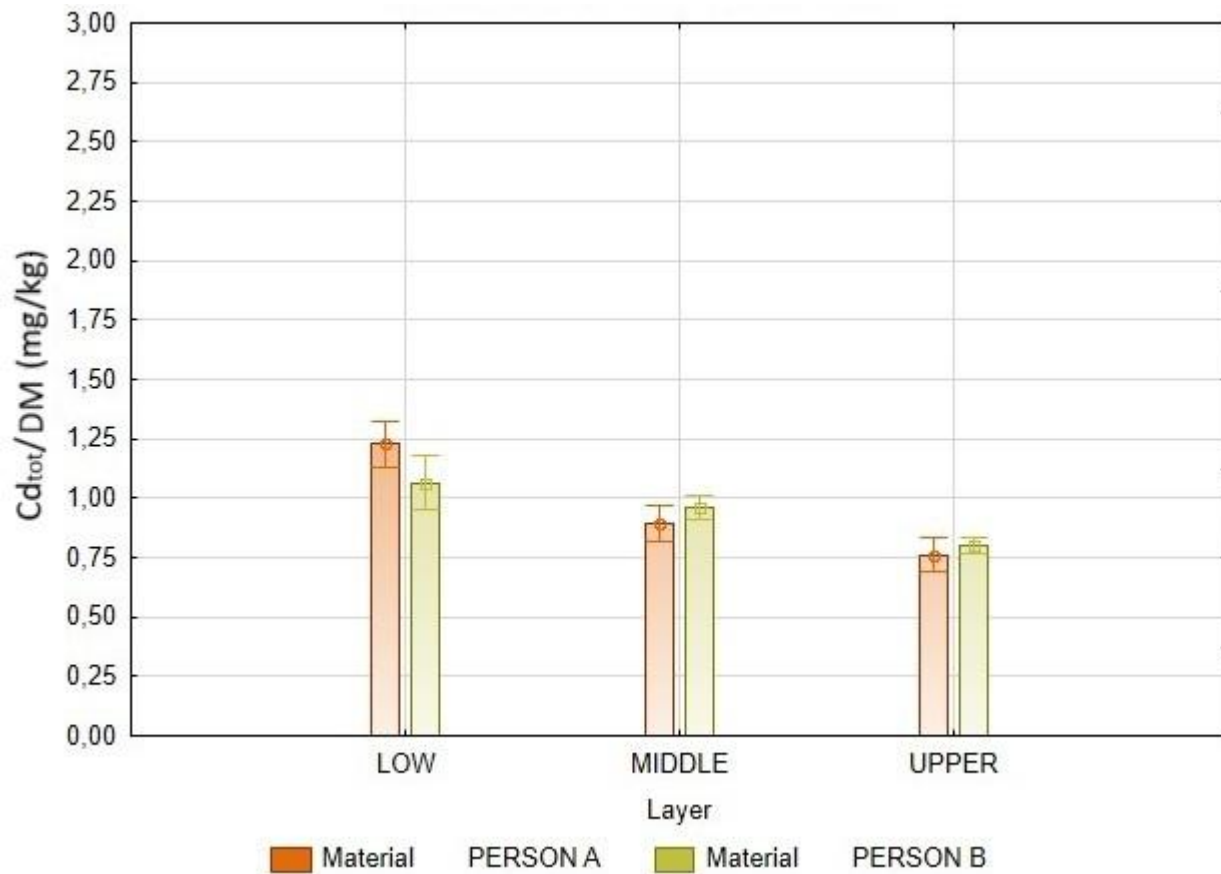
Sampler	Layer	C_{tot}/DM (%) (weighted average)	C_{tot}/DM (%) (SEM)	C_{tot}/DM (%) (-SEM)	C_{tot}/DM (%) (+SEM)	N
PERSON A	LOW	13,36400	0,423866	12,94013	13,78787	10
PERSON A	MIDDLE	14,09167	0,717288	13,37438	14,80896	6
PERSON A	UPPER	14,22000	1,044230	13,17577	15,26423	4
PERSON B	LOW	13,05500	0,281809	12,77319	13,33681	10
PERSON B	MIDDLE	14,18833	0,466072	13,72226	14,65440	6
PERSON B	UPPER	13,62000	0,498297	13,12170	14,11830	4

Note: SEM – Standard Error of the Mean

Tukey's Honest Significant Difference (HSD) test

Sampler	Layer	C_{tot}/DM (%) (weighted average)	1	2
PERSON A	LOW	13,36400	****	
PERSON A	MIDDLE	14,09167	****	
PERSON A	UPPER	14,22000	****	
PERSON B	LOW	13,05500	****	
PERSON B	MIDDLE	14,18833	****	
PERSON B	UPPER	13,62000	****	

(c) Cd



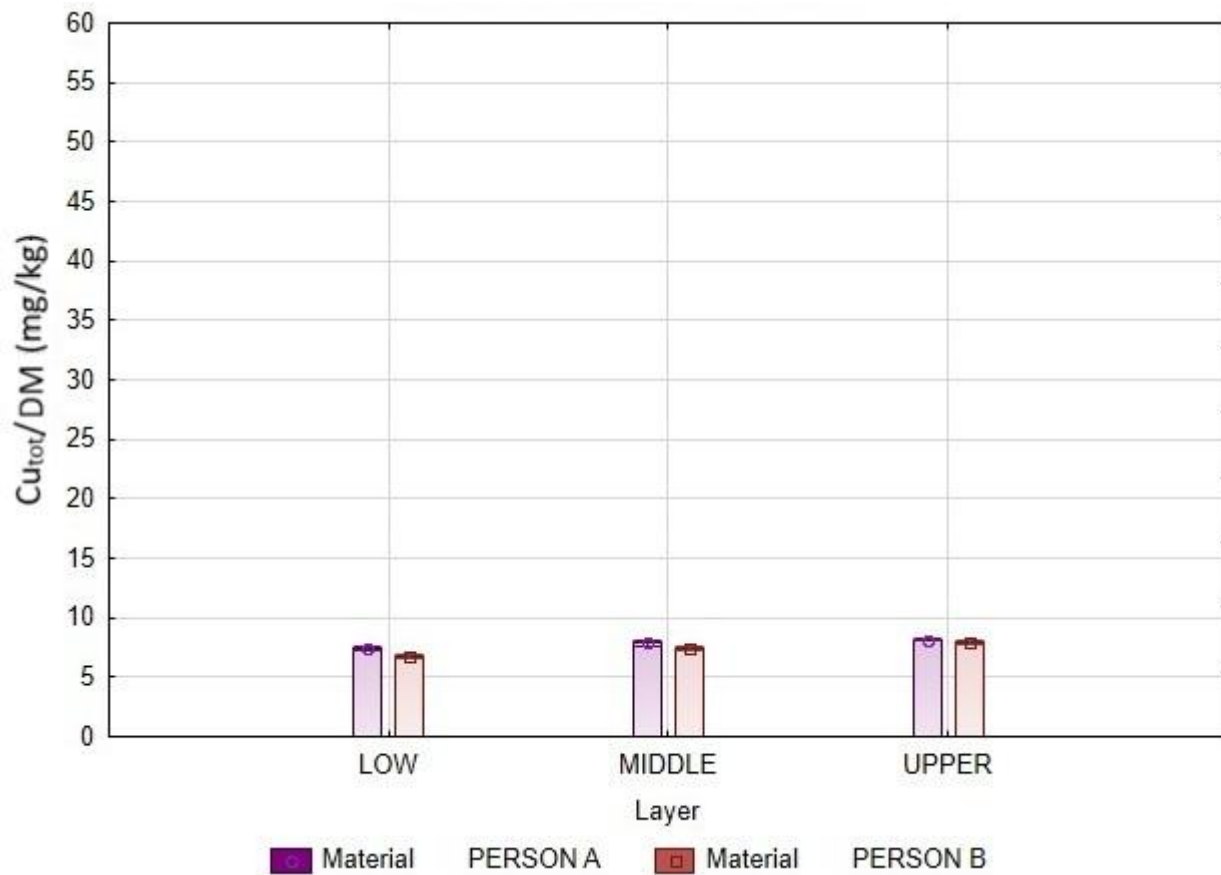
Sampler	Layer	Cd _{tot} /DM (mg/kg) (weighted average)	Cd _{tot} /DM (mg/kg) (SEM)	Cd _{tot} /DM (mg/kg) (-SEM)	Cd _{tot} /DM (mg/kg) (+SEM)	N
PERSON A	LOW	1,227110	0,099679	1,127431	1,326789	10
PERSON A	MIDDLE	0,894817	0,079016	0,815801	0,973833	6
PERSON A	UPPER	0,762350	0,072366	0,689984	0,834716	4
PERSON B	LOW	1,064890	0,112694	0,952196	1,177584	10
PERSON B	MIDDLE	0,959633	0,050208	0,909425	1,009842	6
PERSON B	UPPER	0,800100	0,034995	0,765105	0,835095	4

Note: SEM – Standard Error of the Mean

Tukey's Honest Significant Difference (HSD) test

Sampler	Layer	Cd _{tot} /DM (mg/kg) (weighted average)	1	2
PERSON A	LOW	1,22711	****	
PERSON A	MIDDLE	0,89482	****	
PERSON A	UPPER	0,76235	****	
PERSON B	LOW	1,06489	****	
PERSON B	MIDDLE	0,95963	****	
PERSON B	UPPER	0,80010	****	

(d) Cu



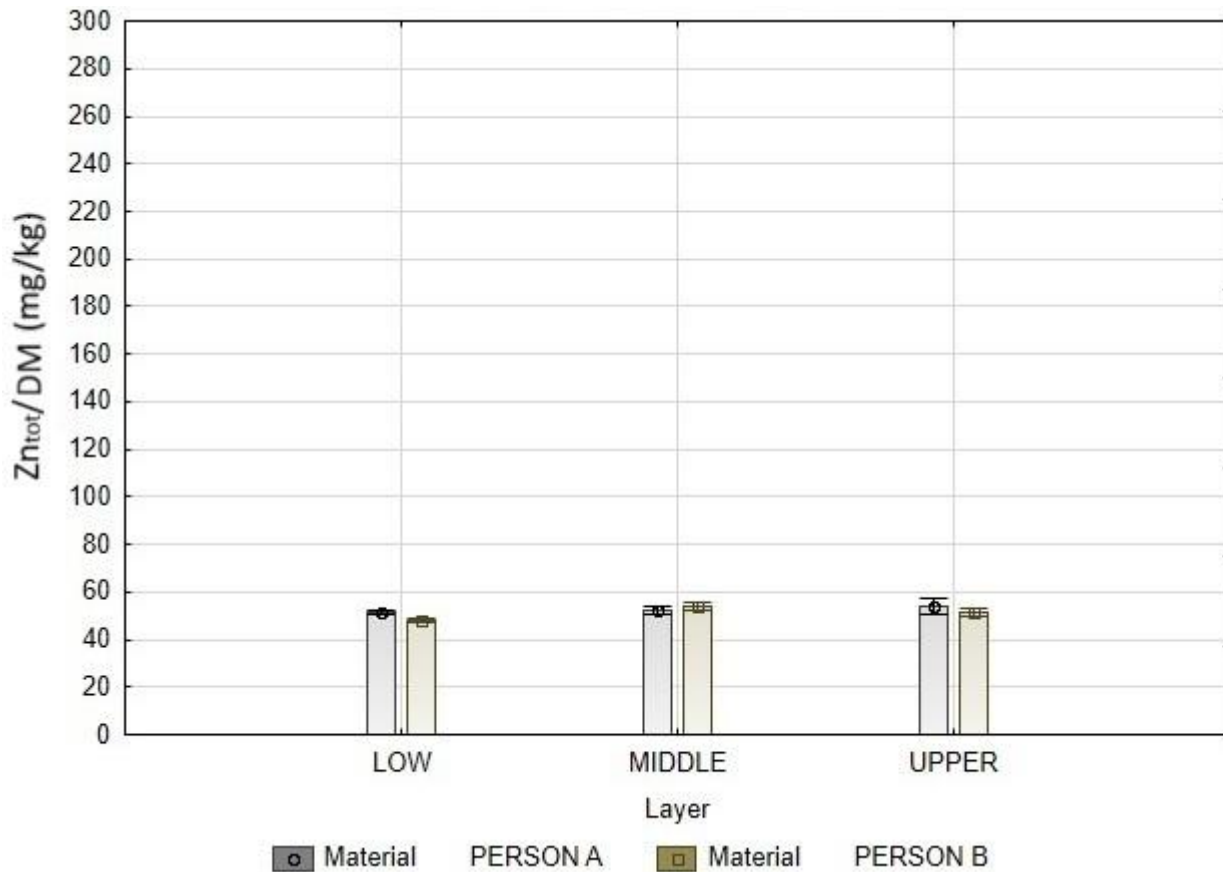
Sampler	Layer	Cu _{tot} /DM (mg/kg) (weighted average)	Cu _{tot} /DM (mg/kg) (SEM)	Cu _{tot} /DM (mg/kg) (-SEM)	Cu _{tot} /DM (mg/kg) (+SEM)	N
PERSON A	LOW	7,439600	0,107569	7,332031	7,547169	10
PERSON A	MIDDLE	7,855333	0,178269	7,677064	8,033603	6
PERSON A	UPPER	8,158750	0,135537	8,023213	8,294287	4
PERSON B	LOW	6,790600	0,161072	6,629528	6,951672	10
PERSON B	MIDDLE	7,415000	0,147438	7,267562	7,562438	6
PERSON B	UPPER	7,930750	0,190004	7,740746	8,120754	4

Note: SEM – Standard Error of the Mean

Tukey's Honest Significant Difference (HSD) test

Sampler	Layer	Cu _{tot} /DM (mg/kg) (weighted average)	1	2
PERSON A	LOW	7,439600	****	
PERSON A	MIDDLE	7,855333	****	
PERSON A	UPPER	8,158750	****	
PERSON B	LOW	6,790600		****
PERSON B	MIDDLE	7,415000	****	****
PERSON B	UPPER	7,930750	****	

(e) Zn



Sampler	Layer	Zn _{tot} /DM (mg/kg) (weighted average)	Zn _{tot} /DM (mg/kg) (SEM)	Zn _{tot} /DM (mg/kg) (-SEM)	Zn _{tot} /DM (mg/kg) (+SEM)	N
PERSON A	LOW	51,34500	0,979729	50,36527	52,32473	10
PERSON A	MIDDLE	52,33167	1,654314	50,67735	53,98598	6
PERSON A	UPPER	54,03000	3,288726	50,74127	57,31873	4
PERSON B	LOW	47,89700	0,922815	46,97419	48,81981	10
PERSON B	MIDDLE	54,07167	1,760966	52,31070	55,83263	6
PERSON B	UPPER	51,55500	1,580593	49,97441	53,13559	4

Note: SEM – Standard Error of the Mean

Tukey's Honest Significant Difference (HSD) test

Sampler	Layer	Zn _{tot} /DM (mg/kg) (weighted average)	1	2
PERSON A	LOW	51,34500	****	****
PERSON A	MIDDLE	52,33167	****	****
PERSON A	UPPER	54,03000	****	****
PERSON B	LOW	47,89700	****	
PERSON B	MIDDLE	54,07167		****
PERSON B	UPPER	51,55500	****	****

Conclusion

The hypothesis was that when sampling homogeneous/uniform materials (here represented by dried pelleted manure) there would be no statistically significant difference when sampling by the dynamic method (from a conveyor belt) or the static method (from a static heap). On the contrary, when sampling heterogeneous materials (here represented by organomineral fertilizers/blends 1 + 2) consisting of particles of different shapes and sizes, the effect of separation of particles from different layers of a static heap would occur - similar to that of mineral fertilizers. Both assumptions were confirmed in experimental tests and subsequent statistical evaluation.

In general, sampling by the dynamic method is considered the most reliable way to obtain representative fertilizer samples - for both uniform and heterogeneous material.

Although there were some deviations between the results obtained by two different samplers (each way of sampling; both uniform and heterogeneous material), they were not statistically significant.

Comparable results were obtained by sampling the uniform material by the dynamic and static methods. It can therefore be generally stated that uniform organic materials can be reliably sampled also from a static heap. The basic assumption is that the material consists of particles of the same shape and size. This principle can logically be extrapolated to organomineral fertilizers, assuming that each physical unit shall contain organic carbon (C_{org}) and all the nutrients in their declared content. A physical unit refers to one of the component pieces of a product, such as granules or pellets (see FPR).

On the other hand, it was confirmed that when sampling fertilizers consisting of particles of different shapes and sizes, the effect of particle separation from different layers of the static heap occurred. There were statistically significant differences both when comparing the individual layers of the heaps with each other, and also in the re-mixed final samples (obtained from incremental samples from the static heaps) when compared with the final samples obtained by the dynamic method.

Recommendation

In view of the above statistical evaluation and conclusions, the project leader proposes the following. Part 5 of EN 1482 (sampling of organic and organo-mineral fertilizers) will not be necessary; instead, the existing standard will be amended and revised. Part 1 will remain unchanged as it applies to fertilizer in general (including inorganic, organic and organo-mineral fertilizers). The scope of the part 3 will be changed to include sampling of uniform organic fertilizers and uniform organomineral fertilizers. There might be two options (see proposed change of the part 3 in the track change mode):

Option A

This document is applicable to the sampling of the ~~following~~-solid ~~inorganic~~-fertilizers and liming materials supplied or ready for supply, and stored in static heaps:

- Single ~~nutrient~~-ingredient fertilizers,

- Uniform ~~compound complex~~ fertilizers,
- Organomineral fertilizers where each physical unit contains organic carbon (Corg) and all the nutrients in their declared content. A physical unit refers to one of the component pieces of a product, such as granules or pellets.
- Milled, granulated or dredged liming materials,
- Any other products, found suitable for sampling by the method described in this part of the standard, i.e. uniform and non-segregating products.
- This document is not applicable to the products which have tendency to segregation when stored in a static heap.

Option B

~~This document is applicable to the sampling of the following solid inorganic fertilizers and liming materials supplied or ready for supply, and stored in static heaps:~~

- ~~Single nutrient fertilizers,~~
- ~~Uniform complex fertilizers,~~
- ~~Milled, granulated or dredged liming materials,~~
- ~~Any other products, found suitable for sampling by the method described in this part of the standard, i.e. uniform and non-segregating products~~

This document is applicable to the sampling of solid fertilizers and liming materials that have an uniform composition and do not have tendency to segregation.

Both option A and B should cover also static way of sampling of uniform organic fertilizers and uniform organomineral fertilizers but the project leader prefers and recommends Option A.

WG 1 is requested to kindly consider and discuss this interim report and the proposed solution. After its approval, further appropriate steps regarding the amendment of Part 3 of EN 1482 should follow (Enquiry, Formal vote etc.).

Jaroslav Houček, project leader

Prague, 9th June 2025



Interim report on the status of the project

Prepared by: Collective of Authors

Published by: Central Institute for Supervising and Testing in Agriculture
July 2026

ISBN: 978-80-7401-268-6

This publication has not undergone language editing.