Cattle manure loadings and legacy effects on Cu and Zn availability under rainfed and irrigated conditions

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Supplemental Material

This section contains one page with one table.

Supplementary Table 1. Total Cu and Zn removals in harvested silage and grain yields from manure applied treatments in 2003, 2008, 2013 and 2018.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | 2003 | | 2008 | | 2013 | | 2018 | |
|  | Cu | Zn | Cu | Zn | Cu | Zn | Cu | Zn |
|  | ------------------------------------------------------ kg ha-1 ------------------------------------------------------------- | | | | | | | |
| Mr0*a* | 0.06(±.02)*b* | 0.17(±.04) | 0.37(±.08) | 0.55(±.06) | 0.06(±.04) | 0.26(±.07) | 0.02(±.01) | 0.10(±.01) |
| Mrf | 0.04(±.02) | 0.17(±.04) | 0.37(±.09) | 0.54(±.09) | 0.07(±.02) | 0.30(±.05) | 0.02(±.00) | 0.09(±.01) |
| Mr30 | 0.11(±.04) | 0.28(±.04) | 0.33(±.04) | 0.64(±.02) | 0.12(±.06) | 0.54(±.09) | 0.02(±.01) | 0.11(±.02) |
| Mr60 | 0.06(±.01) | 0.24(±.04) | 0.34(±.09) | 0.67(±.13) | 0.07(±.01) | 0.43(±.08) | 0.01(±.01) | 0.09(±.05) |
| Mr90 | 0.06(±.03) | 0.22(±.03) | 0.33(±.09) | 0.76(±.09) | 0.09(±.03) | 0.48(±.08) | 0.02(±.01) | 0.09(±.05) |
| DDr30 | 0.05(±.01) | 0.19(±.03) | 0.37(±.03) | 0.64(±.10) | 0.04(±.06) | 0.34(±.04) | 0.02(±.01) | 0.11(±.05) |
| DDr60 | 0.10(±.02) | 0.30(±.02) | 0.53(±.03) | 0.97(±.18) | 0.07(±.02) | 0.38(±.05) | 0.02(±.00) | 0.12(±.01) |
| DDr90 | 0.04(±.02) | 0.20(±.02) | 0.32(±.05) | 0.65(±.02) | 0.08(±.03) | 0.38(±.09) | 0.02(±.00) | 0.19(±.04) |
| Dr30 | 0.05(±.01) | 0.12(±.05) | 0.40(±.12) | 0.47(±.10) | 0.08(±.07) | 0.26(±.07) | 0.02(±.00) | 0.09(±.01) |
| Dr60 | 0.12(±.02) | 0.20(±.09) | 0.49(±.19) | 0.59(±.13) | 0.08(±.02) | 0.27(±.09) | 0.02(±.00) | 0.10(±.03) |
| Dr90 | 0.06(±.05) | 0.14(±.07) | 0.44(±.12) | 0.52(±.12) | 0.08(±.05) | 0.24(±.03) | 0.02(±.00) | 0.12(±.09) |
| Mi0 | 0.06(±.01) | 0.34(±.08) | 0.46(±.10) | 0.66(±.17) | 0.08(±.03) | 0.34(±.10) | 0.04(±.01) | 0.25(±.05) |
| Mif | 0.05(±.02) | 0.34(±.10) | 0.55(±.11) | 0.74(±.09) | 0.09(±.04) | 0.40(±.09) | 0.04(±.02) | 0.24(±.03) |
| Mi60 | 0.07(±.05) | 0.34(±.20) | 0.64(±.15) | 1.15(±.19) | 0.10(±.03) | 0.58(±.10) | 0.04(±.00) | 0.33(±.02) |
| Mi120 | 0.20(±.12) | 0.56(±.22) | 0.50(±.14) | 1.17(±.28) | 0.08(±.00) | 0.52(±.33) | 0.04(±.00) | 0.29(±.07) |
| Mi180 | 0.04(±.01) | 0.47(±.10) | 0.45(±.04) | 1.13(±.10) | 0.11(±.03) | 0.64(±.17) | 0.02(±.00) | 0.28(±.18) |
| DDi60 | 0.05(±.01) | 0.37(±.07) | 0.49(±.08) | 0.84(±.05) | 0.11(±.02) | 0.43(±.02) | 0.03(±.01) | 0.36(±.18) |
| DDi120 | 0.06(±.01) | 0.36(±.02) | 0.67(±.15) | 1.14(±.19) | 0.09(±.02) | 0.53(±.09) | 0.03(±.00) | 0.28(±.06) |
| DDi180 | 0.08(±.06) | 0.47(±.02) | 0.67(±.20) | 1.37(±.08) | 0.11(±.01) | 0.55(±.07) | 0.04(±.01) | 0.39(±.11) |
| Di60 | 0.06(±.01) | 0.34(±.02) | 0.51(±.24) | 0.75(±.26) | 0.10(±.02) | 0.30(±.03) | 0.05(±.00) | 0.25(±.05) |
| Di120 | 0.07(±.00) | 0.37(±.00) | 0.49(±.22) | 0.75(±.28) | 0.12(±.06) | 0.50(±.03) | 0.03(±.00) | 0.40(±.07) |
| Di180 | 0.05(±.02) | 0.30(±.14) | 0.57(±.21) | 0.82(±.19) | 0.09(±.02) | 0.35(±.05) | 0.05(±.00) | 0.23(±.01) |

*a*M – Manure continuous applications since 1973; DD- Delayed Discontinued manure in 2003; D- Discontinued manure in 1987; i=irrigated, r=rainfed; 0=control; f=fertilizer N added beginning in 1990, 30, 60, 90, 120, and 180 = manure rates in Mg ha-1

*b*standard deviation