

Supplementary material

Table S3. Soil chemical properties under mineral and organic fertilizers and different crops (June 2022)

Treatments	pH	C _{org} (%)	Humus (%)	Nt (%)
Mixture of perennial grasses and legumes				
V1 - Control	5.95 ± 0.10 a (cv)	2.01 ± 0.07 d (cv)	3.45 ± 0.04 c (cv)	0.154 ± 0.002 c (cv)
V2 - NPK	5.56 ± 0.15 d (ooo)	2.02 ± 0.08 d (ns)	3.48 ± 0.13 c (ns)	0.161 ± 0.003 b (*)
V3 – 15 t/ha MC	6.07 ± 0.12 a (ns)	2.17 ± 0.05 c (*)	3.74 ± 0.06 b (*)	0.171 ± 0.002 a (***)
V4 – 15 t/ha MC + NPK	5.66 ± 0.21 c (oo)	2.21 ± 0.04 b (**)	3.81 ± 0.05 b (*)	0.174 ± 0.004 a (***)
V5 – 30 t/ha MC	6.07 ± 0.05 a (ns)	2.22 ± 0.05 b (**)	3.82 ± 0.12 b (*)	0.175 ± 0.003 a (***)
V6 – 30 t/ha MC + NPK	5.83 ± 0.22 b (ns)	2.22 ± 0.03 b (**)	3.82 ± 0.15 b (*)	0.175 ± 0.003 a (***)
V7 – 60 t/ha MC	5.87 ± 0.09 b (ns)	2.30 ± 0.09 a (***)	3.96 ± 0.17 a (**)	0.180 ± 0.004 a (***)
V8 – 60 t/ha MC + NPK	6.00 ± 0.02 a (ns)	2.26 ± 0.04 b (**)	3.89 ± 0.15 a (**)	0.177 ± 0.003 a (***)
<i>LSD</i>	<i>LSD 5% - 0.248</i> <i>LSD 1% - 0.376</i> <i>LSD 0.1% - 0.604</i>	<i>LSD 5% - 0.116%</i> <i>LSD 1% - 0.176%</i> <i>LSD 0.1% - 0.283%</i>	<i>LSD 5% - 0.250%</i> <i>LSD 1% -0.378%</i> <i>LSD 0.1% - 0.608%</i>	<i>LSD 5% - 0.006%</i> <i>LSD 1% - 0.009%</i> <i>LSD 0.1% - 0.015%</i>
Treatments	pH	C _{org} (%)	Humus (%)	Nt (%)
Winter wheat crop				
V1 - Control	6.01 ± 0.03 b (cv)	2.03 ± 0.09 c (cv)	3.49 ± 0.27 c (cv)	0.157 ± 0.002 c (cv)
V2 - NPK	5.71 ± 0.06 c (oo)	2.21 ± 0.11 b (ns)	3.81 ± 0.07 b (*)	0.174 ± 0.003 b (**)
V3 – 15 t/ha MC	6.25 ± 0.05 a (**)	2.30 ± 0.06 a (*)	3.96 ± 0.13 a (**)	0.180 ± 0.005 a (***)
V4 – 15 t/ha MC + NPK	5.60 ± 0.15 d (ooo)	1.99 ± 0.19 c (ns)	3.43 ± 0.09 c (ns)	0.159 ± 0.006 c (ns)
V5 – 30 t/ha MC	6.27 ± 0.02 a (**)	2.25 ± 0.16 b (ns)	3.87 ± 0.14 b (*)	0.177 ± 0.004 b (**)
V6 – 30 t/ha MC + NPK	6.06 ± 0.07 b (ns)	2.36 ± 0.13 a (*)	4.06 ± 0.11 a (**)	0.184 ± 0.004 a (**)
V7 – 60 t/ha MC	6.25 ± 0.03 a (**)	2.30 ± 0.13 ab (ns)	3.96 ± 0.15 a (**)	0.180 ± 0.006 a (***)
V8 – 60 t/ha MC + NPK	5.92 ± 0.10 b (ns)	2.23 ± 0.13 b (ns)	3.84 ± 0.16 b (*)	0.175 ± 0.004 b (**)
<i>LSD</i>	<i>LSD 5% - 0.145</i> <i>LSD 1% - 0.219</i> <i>LSD 0.1% - 0.352</i>	<i>LSD 5% - 0.263%</i> <i>LSD 1% - 0.399%</i> <i>LSD 0.1% - 0.641%</i>	<i>LSD 5% - 0.257%</i> <i>LSD 1% -0.389%</i> <i>LSD 0.1% - 0.624%</i>	<i>LSD 5% - 0.010%</i> <i>LSD 1% - 0.014%</i> <i>LSD 0.1% - 0.023%</i>

Treatments	pH	C _{org} (%)	Humus (%)	Nt (%)
Maize crop				
V1 - Control	5.85 ± 0.14 a (cv)	2.08 ± 0.06 c (cv)	3.58 ± 0.10 d (cv)	0.168 ± 0.006 c (cv)
V2 - NPK	5.54 ± 0.06 b (o)	2.25 ± 0.05 c (ns)	3.87 ± 0.08 c (ns)	0.177 ± 0.005 c (ns)
V3 – 15 t/ha MC	5.90 ± 0.20 a (ns)	2.23 ± 0.08 c (ns)	3.84 ± 0.14 c (ns)	0.175 ± 0.004 c (ns)
V4 – 15 t/ha MC + NPK	5.46 ± 0.14 b (o)	2.22 ± 0.10 c (ns)	3.82 ± 0.18 c (ns)	0.175 ± 0.007 c (ns)
V5 – 30 t/ha MC	5.78 ± 0.10 a (ns)	2.44 ± 0.09 a (**)	4.20 ± 0.16 a (**)	0.189 ± 0.004 a (**)
V6 – 30 t/ha MC + NPK	5.84 ± 0.15 a (ns)	2.30 ± 0.12 b (*)	3.96 ± 0.20 b (*)	0.180 ± 0.003 b (*)
V7 – 60 t/ha MC	5.88 ± 0.16 a (ns)	2.28 ± 0.10 b (*)	3.93 ± 0.18 b (*)	0.179 ± 0.005 b (*)
V8 – 60 t/ha MC + NPK	5.69 ± 0.20 b (ns)	2.25 ± 0.13 c (ns)	3.87 ± 0.21 c (ns)	0.177 ± 0.003 c (ns)
LSD	LSD 5% - 0.284 LSD 1% - 0.430 LSD 0.1% - 0.691	LSD 5% - 0.202% LSD 1% - 0.305% LSD 0.1% - 0.490%	LSD 5% - 0.346% LSD 1% - 0.524% LSD 0.1% - 0.842%	LSD 5% - 0.010% LSD 1% - 0.015% LSD 0.1% - 0.024%
Treatments	pH	C _{org} (%)	Humus (%)	Nt (%)
Soybean crop				
V1 - Control	6.03 ± 0.05 b (cv)	1.97 ± 0.05 d (cv)	3.39 ± 0.20 d (cv)	0.156 ± 0.005 d (cv)
V2 - NPK	6.05 ± 0.06 b (ns)	2.04 ± 0.07 d (ns)	3.50 ± 0.13 d (ns)	0.162 ± 0.004 d (ns)
V3 – 15 t/ha MC	6.21 ± 0.07 a (ns)	2.31 ± 0.05 a (***)	3.98 ± 0.09 b (**)	0.181 ± 0.006 b (**)
V4 – 15 t/ha MC + NPK	5.92 ± 0.20 b (ns)	2.41 ± 0.05 a (***)	4.15 ± 0.10 a (***)	0.187 ± 0.003 a (***)
V5 – 30 t/ha MC	5.85 ± 0.09 c (ns)	2.07 ± 0.12 d (ns)	3.56 ± 0.09 d (ns)	0.167 ± 0.005 c (*)
V6 – 30 t/ha MC + NPK	5.92 ± 0.18 b (ns)	2.13 ± 0.08 c (*)	3.67 ± 0.13 c (*)	0.169 ± 0.007 c (*)
V7 – 60 t/ha MC	5.82 ± 0.18 c (ns)	2.20 ± 0.08 b (**)	3.79 ± 0.15 b (**)	0.173 ± 0.005 b (**)
V8 – 60 t/ha MC + NPK	5.87 ± 0.10 b (ns)	2.12 ± 0.04 c (*)	3.65 ± 0.07 c (*)	0.168 ± 0.003 c (*)
LSD	LSD 5% - 0.252 LSD 1% - 0.382 LSD 0.1% - 0.613	LSD 5% - 0.137% LSD 1% - 0.208% LSD 0.1% - 0.334%	LSD 5% - 0.250% LSD 1% - 0.378% LSD 0.1% - 0.607%	LSD 5% - 0.011% LSD 1% - 0.016% LSD 0.1% - 0.026%

Significant differences between treatments are indicated by different lowercase letters (Duncan's test; $p < 0.05$; mean \pm SD, $n = 4$). Means followed by the same letter are not significantly different (ns); ***, **, and * indicate significant differences at LSD 5%, LSD 1%, and LSD 0.1% respectively; ns—non-significant; ooo, oo, and o, indicate negative significant differences compared to the control; cv – control variant.

Abbreviations: manure compost (MC); chemical fertilisers only (NPK); least significant differences (LSD); organic carbon (C_{org}); total nitrogen (Nt)