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Soil Research

Supplementary Material

Impacts of long-term rice-based organic farming on fractions and forms of soil organic carbon and nitrogen in the Indo-Gangetic Plain

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Supplementary material (tables)

Table **1**. Sensitivity index of various soil organic carbon fractions after rice crop as affected by application of organics, crop residues and biofertilizers

CS_Treat	FYM	VC	FYM+CR	VC+CR	FYM+CR+BF	VC+CR+BF	**Mean**
TOC							
R-W-M	9.51^{k}	25.38^{j}	42.47^{h}	61.48^{f}	78.19^{d}	103.44^{b}	**45.78^{B}**
R-W	11.82^{k}	33.82^{i}	49.55^{g}	73.05^{e}	93.69^{c}	122.63^{a}	**54.94^{A}**
Mean	**10.67^{F}**	**29.60^{E}**	**46.01^{D}**	**67.26^{C}**	**85.94^{B}**	**113.04^{A}**	
WBC							
R-W-M	18.76^{h}	25.19^{fg}	42.75^{e}	54.99^{d}	72.63^{c}	87.42^{b}	**43.10^{B}**
R-W	20.26^{gh}	28.68^{f}	50.17^{d}	67.46^{c}	83.83^{b}	97.55^{a}	**49.71^{A}**
Mean	**19.51^{F}**	**26.93^{E}**	**46.46^{D}**	**61.22^{C}**	**78.23^{B}**	**92.48^{A}**	
MBC							
R-W-M	65.82^{j}	69.84^{i}	77.52^{h}	89.99^{g}	102.63^{e}	118.45^{c}	**74.89^{B}**
R-W	87.08^{g}	94.62^{f}	102.27^{e}	113.66^{d}	130.51^{b}	141.73^{a}	**95.70^{A}**
Mean	**76.45^{F}**	**82.23^{E}**	**89.90^{D}**	**101.83^{C}**	**116.57^{B}**	**130.09^{A}**	
C_{VL}							
R-W-M	45.95	82.84	100.06	117.33	141.08	163.30	**92.94**
R-W	51.76	68.89	77.40	131.62	143.38	156.76	**89.97**
Mean	**48.86^{E}**	**75.87^{D}**	**88.73^{D}**	**124.47^{C}**	**142.23^{B}**	**160.03^{A}**	
C_{L}							
R-W-M	21.28	26.56	38.82	48.47	59.51	82.90	**39.65**
R-W	27.25	42.41	62.78	68.20	86.50	101.28	**55.49**
Mean	**24.27^{E}**	**34.48^{DE}**	**50.80^{CD}**	**58.34^{BC}**	**73.01^{AB}**	**92.09^{A}**	
C_{LL}							
R-W-M	-10.02	-37.37	-7.76	6.03	28.78	17.30	**-0.43**
R-W	-10.06	-18.66	26.85	20.63	49.77	61.08	**18.52**
Mean	**-10.04^{BC}**	**-28.01^{C}**	**9.54^{B}**	**13.33^{AB}**	**39.28^{A}**	**39.19^{A}**	
C_{NL}							
R-W-M	-1.41	26.28	42.90	70.27	85.52	123.58	**49.59**
R-W	1.46	41.28	48.88	80.24	106.78	155.72	**62.05**
Mean	**0.02^{F}**	**33.78^{E}**	**45.89^{D}**	**75.25^{C}**	**96.15^{B}**	**139.65^{A}**	

Where, TOC=Total organic carbon; WBC=Walkley-Black carbon; C_{VL}= very labile carbon; C_{L}= labile carbon; C_{LL}= less labile carbon; C_{NL}= non-labile carbon; RWMCS = Rice-wheat-mungbean cropping systems, RWCS = Rice-wheat cropping systems; CS_Treat = Cropping systems_Treatments. For each parameter, different lower and upper case letters within rows and columns indicate that treatment means significantly differ according to LSD test (*P=0.05*)

Table 2. Sensitivity index of different nitrogen pools after rice crop as affected by application of organics, crop residues and biofertilizers

CS_Treat	FYM	VC	FYM+CR	VC+CR	FYM+CR+BF	VC+CR+BF	**Mean**
TN							
RWMCS	3.46^{e}	3.40^{e}	3.88^{d}	5.95^{a}	2.18^{gh}	1.90^{h}	**2.97**
RWCS	4.81^{c}	4.16^{d}	2.59^{fg}	5.41^{b}	2.88^{f}	2.62^{f}	**3.21**
Mean	**4.13^{B}**	**3.78^{BC}**	**3.23^{C}**	**5.68^{A}**	**2.53^{D}**	**2.26^{D}**	
LBN							
RWMCS	9.70^{ef}	12.12^{cd}	13.14^{bcd}	15.35^{bc}	15.18^{bc}	16.67^{b}	**11.74**
RWCS	8.94^{f}	11.04^{d}	11.04^{d}	15.23^{bc}	17.32^{ab}	19.41^{a}	**11.85**
Mean	**9.32^{D}**	**11.58^{C}**	**12.09^{C}**	**15.29^{B}**	**16.25^{B}**	**18.04^{A}**	
PMN							
RWMCS	64.74^{cd}	60.29^{d}	33.40^{e}	40.69^{e}	87.50^{b}	81.01^{b}	**52.52**
RWCS	78.18^{bc}	61.60^{d}	61.86^{d}	62.16^{d}	105.63^{a}	84.39^{b}	**64.83**
Mean	**71.46^{BC}**	**60.94^{CD}**	**47.63^{D}**	**51.43^{D}**	**96.57^{A}**	**82.70^{AB}**	
MBN							
RWMCS	48.00^{bc}	17.98^{i}	18.44^{hi}	9.50^{j}	43.83^{cd}	30.93^{f}	**24.10^{B}**
RWCS	57.02^{a}	24.49^{gh}	38.59^{de}	28.83^{fg}	52.35^{ab}	33.65^{ef}	**33.56^{A}**
Mean	**52.51^{A}**	**21.23^{C}**	**28.51^{BC}**	**19.16^{C}**	**48.09^{A}**	**32.29^{B}**	
NH_4^+-N							
RWMCS	116.42^{ab}	51.59^{d}	106.62^{bc}	106.61^{bc}	52.64^{d}	73.81^{cd}	**72.53**
RWCS	147.42^{a}	83.10^{bcd}	98.40^{bc}	55.71^{d}	96.23^{bc}	100.10^{bc}	**82.99**
Mean	**131.92^{A}**	**67.34^{D}**	**102.51^{B}**	**81.16^{CD}**	**74.44^{CD}**	**86.96^{C}**	
NO_3^- -N							
RWMCS	57.92^{bc}	59.94^{bc}	46.25^{cd}	57.89^{bc}	102.20^{a}	75.24^{ab}	**57.06**
RWCS	25.28^{def}	14.20^{ef}	14.82^{ef}	51.15^{bcd}	38.37^{cde}	14.20^{ef}	**22.57**
Mean	**41.60^{BC}**	**37.07^{BC}**	**30.53^{C}**	**54.52^{AB}**	**70.28^{A}**	**44.72^{BC}**	
NLN							
RWMCS	1.71^{cd}	0.95^{de}	1.28^{d}	3.30^{a}	-1.47^{fg}	-2.27^{g}	**0.50**
RWCS	3.68^{a}	2.29^{bc}	0.28^{e}	2.72^{ab}	-1.06^{f}	-1.97^{fg}	**0.85**
Mean	**2.69^{A}**	**1.62^{B}**	**0.78^{BC}**	**3.01^{A}**	**-1.27^{D}**	**-2.12^{D}**	

Where, TN=Total nitrogen; LBN=labile nitrogen; PMN = potential mineralizable nitrogen; MBN = microbial biomass nitrogen; NH_4^+-N = ammonical nitrogen; NO_3^- -N = nitrate nitrogen; NLN = non-labile nitrogen; RWMCS = Rice-wheat-mungbean cropping systems, RWCS = Rice-wheat cropping systems; CS_Treat = Cropping systems_Treatments. For each parameter, different lower and upper case letters within rows and columns indicate that treatment means significantly differ according to LSD test (*P=0.05*)