

[10.1071/CP21595](https://doi.org/10.1071/CP21595)

Crop & Pasture Science

Supplementary Material

Tillage, crop establishment and residue retention methods for optimising productivity and profitability under rice–wheat system

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Supplementary Table S1. Cost of key inputs and outputs used for economic analysis in rice-wheat cropping system

Particulars	Amount (Rs)
Price of rice seed	Rs 40.0 kg ⁻¹
Price of wheat seed	Rs 30.0 kg ⁻¹
Urea	Rs 12.0 kg ⁻¹ ,
DAP	Rs 45 kg ⁻¹ ,
Murate of potash	Rs 28 kg ⁻¹
Cost of rice nursery raising	Rs 2.0 m ⁻
Plowing/ harrowing	Rs 700 ha ⁻¹
Puddling	Rs 1100 ha ⁻¹
Dry planking	Rs 700 ha ⁻¹
Wet planking	Rs 1000 ha ⁻¹
Sowing of wheat/ DSR	Rs 1000 ha ⁻¹
Sowing of wheat/ DSR with Zero till drill	Rs1200 ha ⁻¹
Transplanting of rice (manual)	Rs 3500 ha ⁻¹
Transplanting of rice with machine	Rs 2750 ha ⁻¹
Sowing of wheat in standing straw (THS)	Rs 2000 ha ⁻¹
Cost of irrigation was taken as	Rs 100 ha ⁻¹ a
Labour	Rs 320 unit ⁻¹ day ⁻¹

1US\$ =65.0 Indian Rupees (Rs)

Supplementary Table S2. Interaction effect of year by wheat establishment method on wheat yield (Mg ha⁻¹) in rice-wheat system

*Wheat establishment methods	Year			
	2010-11	2011-12	2012-13	2013-14
WC	4.81	5.32	5.32	4.77
WZ	3.71	4.26	5.11	4.47
WZR	4.78	5.46	5.68	5.26
LSD _{0.05} for Y x W	0.268			

*Refer to Table 2 for treatment details

Y- Year; W Wheat establishment method

Supplementary Table S3. Total nutrient (N, P and K) uptake (kg ha⁻¹) of rice and wheat (pooled over 4 years) as influenced by crop establishment methods in rice-wheat system

Treatment*	Rice			Wheat		
	N	P	K	N	P	K
(a) Year						
2011	113	16.0	173	96	14.4	61
2012	115	15.3	202	97	15.3	55
2013	128	19.4	200	120	13.2	85
2014	141	22.2	177	134	19.7	80
LSD _{0.05}	13.0	3.1	NS	8.5	1.10	4.7
(b) Rice establishment methods						
RZD	123	17.3	186	115	15.3	68
RCD	131	18.9	194	110	15.3	71
RZM	111	15.6	169	108	16.3	69
RCP	133	21.1	205	114	15.7	74
LSD _{0.05}	10.0	2.0	16.0	NS	NS	NS
(c) Wheat establishment methods						
WC	125	18.6	197	113	15.4	70
WZ	117	17.0	167	97	14.3	58
WZR	132	19.1	200	126	17.2	83
LSD _{0.05}	7.0	1.1	8.0	4.4	0.99	3.9
All interactions	NS	NS	**Yx W	**Yx W	**Yx W	**Yx W

*Refer to table 2 for treatment details

** Year X wheat establishment interaction significant at $P=0.05$

Supplementary Table S4. Linear relationships between grain yield (Mg ha^{-1}) and N, P and K uptake (kg ha^{-1}) of rice and wheat in different years, irrespective of treatment

Nutrient	Linear regression equation		'r'
Rice			
N	$y=19.87x + 0.67$		0.68*
P	$y= 4.14 x-7.40$		0.58*
K	$y=25.82x + 27.49$		0.57*
Wheat			
N	$y= 27.60x-22.34$		0.67*
P	$y= 4.28x - 5.09$		0.64*
K	$y=19.60x-26.0$		0.55*

Note:

y = nutrient (N, P, K) uptake (kg ha^{-1}); x = yield (Mg ha^{-1}), *= significant at $P=0.05$, $n=48$