

**Supplementary Table 1.** Shoot and root length (cm), and tillers m<sup>-2</sup> of rice as influenced by crop establishment and residue management during the wet season, and N management in the succeeding maize during the dry season in a rice-maize cropping system experiment conducted at ICAR-CSSRI RRS, Canning Town, West Bengal, India from the wet season 2016 to the dry season 2018-19.

Treatment	2016			2017			2018		
	Plant height (cm)	Root length (cm)	Tillers m <sup>-2</sup>	Plant height (cm)	Root length (cm)	Tillers m <sup>-2</sup>	Plant height (cm)	Root length (cm)	Tillers m <sup>-2</sup>
<i>Crop establishment method and residue management (TR) during the wet season</i>									
DSR <sup>*</sup> -R	186.7	24.9	236	183.6	26.2	233	192.1	21.5	316
DSR+R	190.8	26.9	270	188.6	27.4	247	196.7	21.8	404
PTR-R	184.9	21.1	211	176.3	21.0	224	177.7	20.8	276
PTR+R	186.2	21.6	240	179.3	21.9	238	184.7	21.3	328
LSD ( <i>p</i> =0.05)	ns <sup>#</sup>	2.7	ns	7.3	1.45	10	1.7	ns	50
<i>Nitrogen doses in maize (N) during the dry season</i>									
N <sub>0</sub> <sup>§</sup>	187.8	24.4	237	182.0	23.7	237	183.1	21.4	320
N <sub>1</sub>	187.3	24.4	241	181.8	24.1	234	187.5	21.3	318
N <sub>2</sub>	187.2	24.4	240	182.0	24.3	239	189.9	21.4	340
N <sub>3</sub>	186.3	24.4	240	181.9	24.3	232	190.8	21.4	346
LSD ( <i>p</i> =0.05)	ns	ns	ns	ns	ns	ns	0.9	ns	17
TR×N	ns	ns	ns	ns	ns	ns	ns	ns	ns

<sup>\*</sup>DSR, Direct-seeded rice; -R, without residue; +R, with residue; PTR, Puddled transplanted rice;

<sup>§</sup>N<sub>0</sub>, N<sub>1</sub>, N<sub>2</sub>, N<sub>3</sub>, refer to 0, 80, 120 and 160 kg N ha<sup>-1</sup>, respectively; <sup>#</sup>ns, not significant.

**Supplementary Table 2.** Yield attributes of rice as influenced by crop establishment method and residue management during the wet season, and N management in the succeeding maize crop during the dry season in a cropping system experiment conducted at ICAR-CSSRI RRS, Canning Town, West Bengal, India from the wet season 2016 to the dry season 2018-19.

Treatment	2016				2017				2018			
	Panicles m <sup>2</sup>	Grains panicle <sup>-1</sup>	Fertilit y (%)	1000 grain wt. (g)	Panicles m <sup>2</sup>	Grains panicle <sup>-1</sup>	Fertilit y (%)	1000 grain wt. (g)	Panicles m <sup>2</sup>	Grains panicle <sup>-1</sup>	Fertility (%)	1000 grain wt. (g)
<i>Crop establishment method and residue management (TR) during the wet season</i>												
DSR <sup>*</sup> -R	193	96	86.4	31.3	192	102	89.9	31.2	273	114	92.9	30.4
DSR+R	203	104	85.5	31.7	206	110	88.9	32.1	344	137	94.3	31.0
PTR-R	170	94	82.4	31.0	183	109	88.6	32.4	231	104	91.0	30.7
PTR+R	187	95	82.4	31.7	195	117	89.9	32.1	278	116	93.8	30.7
LSD ( <i>p</i> =0.05)	ns <sup>#</sup>	ns	ns	ns	9.6	ns	ns	ns	17.3	12.8	2.2	ns
<i>Nitrogen doses in maize (N) during the dry season</i>												
N <sub>0</sub> <sup>§</sup>	186	96	83.4	31.4	196	110	90.1	31.7	270	106	92.1	30.5
N <sub>1</sub>	186	97	84.3	31.5	192	111	89.0	32.2	271	112	93.3	30.8
N <sub>2</sub>	190	98	84.5	31.5	197	102	88.3	32.2	292	121	93.2	30.8
N <sub>3</sub>	191	98	84.5	31.4	191	115	89.9	31.6	294	133	93.4	30.7
LSD ( <i>p</i> =0.05)	ns	ns	ns	ns	ns	ns	ns	ns	16.7	5.9	ns	ns
TR×N	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns

<sup>\*</sup>DSR, Direct-seeded rice; -R, without residue; +R, with residue; PTR, Puddled transplanted rice;

<sup>§</sup>N<sub>0</sub>, N<sub>1</sub>, N<sub>2</sub>, N<sub>3</sub>, refer to 0, 80, 120 and 160 kg N ha<sup>-1</sup>, respectively; <sup>#</sup>ns, not significant.

**Supplementary Table 3.** Yield attributes of dry season maize as affected by crop establishment method and residue management in preceding wet season rice, and surface mulching and nitrogen management during the dry season, in a rice-maize cropping system experiment conducted at ICAR-CSSRI RRS, Canning Town, West Bengal, India from the wet season 2016 to the dry season 2018-19.

Treatment	2016-17			2017-18			2018-19		
	Cobs plant <sup>-1</sup>	Kernels cob <sup>-1</sup>	1000 Kernel wt (g)	Cobs plant <sup>-1</sup>	Kernels cob <sup>-1</sup>	1000 Kernel wt (g)	Cobs plant <sup>-1</sup>	Kernels cob <sup>-1</sup>	1000 Kernel wt (g)
<i>Crop establishment method and residue management (TR) during the wet season</i>									
RBS <sup>ψ</sup> -R (DSR <sup>*</sup> -R)	1.4	228	237.3	1.6	232	235.7	1.2	336	234.6
RBS+R (DSR+R)	1.7	282	245.7	1.9	304	250.9	1.4	359	239.5
RBS-R (PTR-R)	1.4	224	234.6	1.5	228	219.6	1.2	286	227.4
RBS+R (PTR+R)	1.6	260	236.9	1.9	276	236.8	1.3	347	238.7
LSD ( <i>p</i> =0.05)	0.25	23.8	5.49	0.24	46.4	13.16	0.08	47.4	ns <sup>#</sup>
<i>Nitrogen doses in maize (N) during the dry season</i>									
N <sub>0</sub> <sup>§</sup>	1.0	155	214.6	1.5	204	217.0	1.1	195	218.2
N <sub>1</sub>	1.6	250	237.8	1.7	245	228.0	1.2	343	231.6
N <sub>2</sub>	1.8	284	250.7	1.8	277	242.9	1.4	389	248.7
N <sub>3</sub>	1.8	304	251.5	1.9	314	255.1	1.4	401	241.7
LSD ( <i>p</i> =0.05)	0.40	29.6	11.3	0.10	17.6	15.6	0.07	24.6	10.2
TR×N	ns	ns	ns	ns	*	*	*	*	ns

<sup>ψ</sup>RBS, Raised bed sowing; -R, without residue; +R, with residue during dry season; <sup>\*</sup>DSR, Direct-seeded rice; -R, without residue; +R, with residue; PTR, Puddled transplanted rice during wet season; <sup>§</sup>N<sub>0</sub>, N<sub>1</sub>, N<sub>2</sub>, N<sub>3</sub>, refer to 0, 80, 120 and 160 kg N ha<sup>-1</sup>, respectively; <sup>#</sup>ns, not significant.

**Supplementary Table 4.** Interactive effects on the economics of dry season maize production as influenced by mulching and nitrogen management during the dry season and the preceding wet season rice crop establishment-residue management, in rice-maize cropping system experiment conducted at ICAR-CSSRI RRS, Canning Town, from the wet season of 2016 to the dry season of 2018-19.

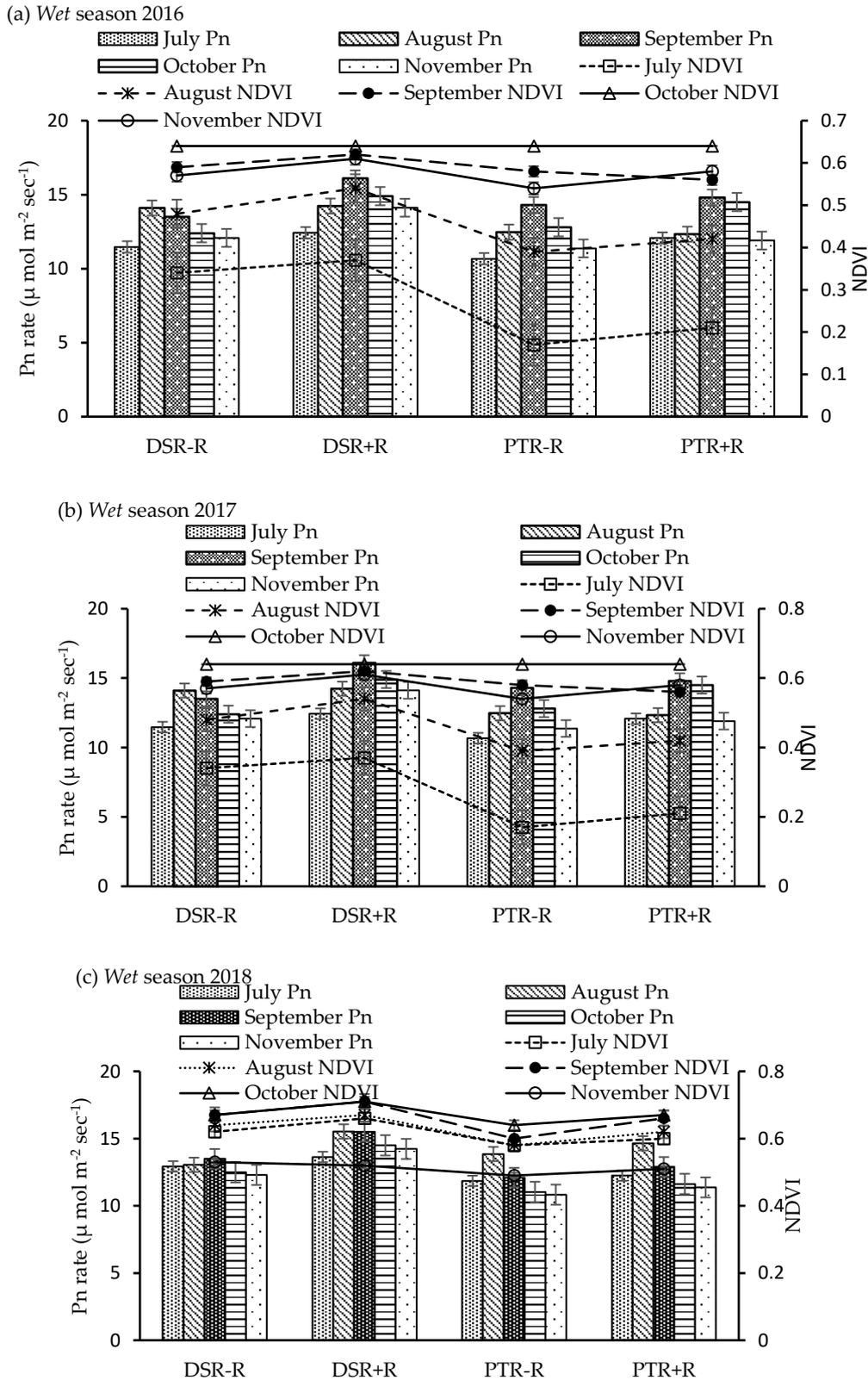
Treatment	2017-18				2018-19			
	N <sub>0</sub> <sup>§</sup>	N <sub>1</sub>	N <sub>2</sub>	N <sub>3</sub>	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	N <sub>3</sub>
	<b>Net income (US\$ ha<sup>-1</sup>)</b>							
RBS <sup>ψ</sup> -R (DSR <sup>@</sup> -R)	-56.5	198.4	501.2	607.8	-11.4	333.7	369.0	526.6
RBS+R (DSR+R)	188.3	619.9	668.1	627.9	69.3	510.3	642.6	669.4
RBS-R (PTR-R)	-177.1	277.5	337.0	420.0	-355.4	55.6	96.7	473.2
RBS+R (PTR+R)	115.7	571.1	632.0	621.2	-218.2	31.0	748.6	600.8
	<b>BCR<sup>#</sup></b>							
RBS-R (DSR-R)	0.92	1.28	1.70	1.83	0.99	1.43	1.47	1.66
RBS+R (DSR+R)	1.29	1.91	1.97	1.89	1.10	1.68	1.85	1.87
RBS-R (PTR-R)	0.75	1.38	1.45	1.56	0.54	1.07	1.12	1.57
RBS+R (PTR+R)	1.03	1.82	1.89	1.86	0.70	1.04	1.96	1.76
<b>LSD<sub>0.05</sub> (interaction)</b>		<b>Net Income</b>		<b>BCR</b>		<b>Net Income</b>		<b>BCR</b>
<b>TR×N*</b>		75.4		0.11		252.4		0.32
<b>TR×N**</b>		83.4		0.12		205.7		0.26

\*Comparison of two sub-plot means at the same main-plot treatment; (TR×N); \*\*Comparison of two main-plot means at the same or different sub-plot treatment; <sup>ψ</sup>RBS, raised bed sowing; -R, without residue mulch; +R, with residue mulch; <sup>@</sup>DSR, direct-seeded rice; PTR, puddled transplanted rice during the wet season; <sup>§</sup>N<sub>0</sub>, N<sub>1</sub>, N<sub>2</sub>, N<sub>3</sub>, refer to 0, 80, 120 and 160 kg N ha<sup>-1</sup>, respectively; <sup>#</sup>BCR, benefit-cost ratio.

**Supplementary Table 5.** Interactive effects on the economics of rice-maize system as influenced by surface mulching and nitrogen management, and preceding wet season rice crop establishment-residue management methods in a rice-maize cropping system experiment conducted at ICAR-CSSRI RRS, Canning Town, from the wet season of 2016 to the dry season of 2018-19.

Treatment	2017-18				2018-19			
	N <sub>0</sub> <sup>§</sup>	N <sub>1</sub>	N <sub>2</sub>	N <sub>3</sub>	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	N <sub>3</sub>
	<b>Net income (US\$ ha<sup>-1</sup>)</b>							
RBS <sup>ψ</sup> -R (DSR <sup>@</sup> -R)	114.1	370.6	675.1	781.7	354.6	955.3	1046.9	1163.5
RBS+R (DSR+R)	451.6	893.2	940.5	910.6	625.8	1259.6	1470.3	1470.2
RBS-R (PTR-R)	-99.5	358.2	418.3	501.6	-350.5	174.6	432.2	987.7
RBS+R (PTR+R)	294.2	759.7	821.6	820.5	111.5	375.4	1109.6	1078.9
	<b>BCR<sup>#</sup></b>							
RBS-R (DSR-R)	1.10	1.31	1.56	1.64	1.26	1.69	1.75	1.83
RBS+R (DSR+R)	1.40	1.78	1.81	1.78	1.46	1.91	2.06	2.05
RBS-R (PTR-R)	0.92	1.27	1.32	1.38	0.76	1.12	1.28	1.64
RBS+R (PTR+R)	1.24	1.61	1.65	1.65	1.08	1.25	1.74	1.72
<b>LSD<sub>0.05</sub> (interaction)</b>		<b>Net Income</b>		<b>BCR</b>	<b>Net Income</b>		<b>BCR</b>	
<b>TR×N*</b>		76.8		0.06	279.5		0.19	
<b>TR×N**</b>		75.7		0.06	275.2		0.19	

\* Comparison of two sub-plot means at the same main-plot treatment; (TR×N); \*\* Comparison of two main-plot means at the same or different sub-plot treatment; <sup>ψ</sup>RBS, raised bed sowing; -R, without residue mulch; +R, with residue mulch; <sup>@</sup>DSR, direct-seeded rice; PTR, puddled transplanted rice during the wet season; <sup>§</sup>N<sub>0</sub>, N<sub>1</sub>, N<sub>2</sub>, N<sub>3</sub>, refer to 0, 80, 120 and 160 kg N ha<sup>-1</sup>, respectively; <sup>#</sup>BCR, benefit-cost ratio.



**Supplementary Figure 1.** Normalized difference vegetation index (NDVI) and net photosynthesis rate (Pn;  $\mu\text{mol m}^{-2}\text{s}^{-1}$ ) of wet season rice as influenced by tillage and crop residue management during the wet season in a rice-maize cropping system experiment conducted at ICAR-CSSRI RRS, Canning Town, West Bengal, India from the wet season 2016 to the dry season 2018-19. DSR, Direct-seeded rice; -R, without residue; +R, with residue; PTR, Puddled transplanted rice.



**Supplementary Photo 1.** Effect of salinity on rice seedlings in the nursery (without residue) grown for the use in puddled transplanted rice.



**Supplementary Photo 2.** Effect of salinity on rice seedlings in DSR plots without residue (left half) and with residue (right half) in a rice-maize cropping system experiment conducted at ICAR-CSSRI RRS, Canning Town, from the wet season 2016 to the dry season 2018-19.