**SUPPLEMENTARY TABLES**

**Supplementary Table 1:** Unit cost of input and produce used in rice-ratoon rice cropping sequence

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Sl. No. | | Particulars | | Quantity/ha | Rate (Rs.) | Amount (Rs. ha-1) |
| Input | | | | | | |
| 1 | Fertilizer | | | | | |
| Urea | | 140 kg | | 7.00 kg-1 | 980.00 |
| Diammonium phosphate | | 88 kg | | 26.00 kg-1 | 2288.00 |
| Muriate of Potash | | 67 kg | | 16.00 kg-1 | 1072.00 |
| 2 | Seed | | | | | |
| Rice seed | | 30 kg | | 25 kg-1 | 750.00 |
| 3 | Pesticides | | | | | |
| Bavistin | | 60 g | | 600 kg-1 | 36.00 |
| Carbofuran 3 G | | 30 kg | | 70 kg-1 | 2100.00 |
| Chloropyriphos 20 EC | | 3 lit | | 320 lit-1 | 960.00 |
| 4 | Land preparation  (Tractor 16 hrs ha-1) | | 16 hrs | | 350 hr-1 | 5600.00 |
| 5 | Herbicide and other weed management practices | | | | | |
| Azimsulfuron 50DF | | 70 g | | 982 per 28g | 2455.00 |
| Bispyribac sodium (Nominee Gold 10% EC) | | 300ml | | 408 per 40 ml | 3060.00 |
| Flucetosulfuron 10WP | | 250 g | | 910 per 100g | 2275.00 |
| Bensulfuron methyl+pretilachlor 60+600 g ha-1 (Londax power) | | 10 kg | | 725 per 4 kg | 1812.50 |
| Weed free (hand weeding at 15,30,45 and 60 DAS) | | 54 Man days | | 194 & 204 Man days -1 in 2015 & 2016 respectively |  |
| Hand weeding (twice) | | 38 Man days | | Same as above |  |
| Paddy weeder fb hand weeding (once) | | 22 Man days | | Same as above |  |
| Herbicide spray (once) | | 2 Man days | | Same as above |  |
| Herbicide spray (twice) | | 4 Man days | | Same as above |  |
| 6 | Irrigation (hiring of pump sets) | | 36 hrs | | 150 hour-1 | 5400.00 |
| 7 | Labour for other field operations | | 64 Man days | | 194 & 204 Man days -1 in 2015 & 2016 respectively |  |
| Produce | | | | | | |
| 8  9. | Rice Grain | | - | | 1410 and1470 kg-1 in 2015 and 2016 respectively |  |
| Rice Straw | | - | | 500 t-1 |  |

**Supplementary Table 2**: Energy equivalent of inputs and outputs used in rice-ratoon rice cropping system

|  |  |  |
| --- | --- | --- |
| Input | Unit | MJ/unit |
| Human labour | Man hour | 1.96 |
| Fossil Fuel ( Diesel) | L | 47.87 |
| Electricity | kWh | 3.6 |
| Nitrogen (N) | kg | 60.6 |
| Phosphorus (P2O5) | kg | 11.1 |
| Potassium (K2O) | kg | 6.7 |
| Farm Yard Manure | kg | 0.47 |
| Insecticides/Pesticides/Weedicides | kg | 120 |
| Insecticides/Pesticides/Weedicides | L | 102 |
| Fungicide | kg | 97 |
| Machinery including self-propelled | kg | 68.4 |
| Electric motor | kg | 64.8 |
| Irrigation | m3 | 1.02 |
| Seeds (Rice) | kg | 14.7 |
| Output |  |  |
| Grain (Rice) | kg | 14.7 |
| Straw (Rice) | kg | 12.5 |

**Supplementary Table 3 Weed flora infested the main rice crop (averaged data of two years)**

|  |  |  |  |
| --- | --- | --- | --- |
| Scientific name | Common name | Family | Weed composition (%) |
| Grasses |  |  | (15.11) |
| *Echinochloa glabrescens* Munro ex Hook. f. | Cockspur Grass | Poaceae | 6.96 |
| *Leptochloa chinensis* (L.) Nees | Chinese Sprangletop | Poaceae | 6.00 |
| *Echinochloa crus-galli* (L.) P. Beauv. | Barn yard Grass | Poaceae | 1.60 |
| *Echinochloa colona* (L.) Link | Jungle Rice | Poaceae | 0.55 |
| Sedges |  |  | (71.44) |
| *Cyperus difformis* L. | Small flower Umbrella Sedge | Cyperaceae | 40.24 |
| *Scirpus juncoides Roxb.* | Bulrush | Cyperaceae | 26.33 |
| *Cyperus iria* L. | Rice Flat Sedge | Cyperaceae | 3.51 |
| *Fimbristylis mileacea* (L.) Vahl | Forked Fringerush | Cyperaceae | 1.39 |
| Broad leaved weeds |  |  | (13.42) |
| *Ludwigia adscendes* (L.) Hara | Water Primose | Onagraceae | 0.83 |
| *Sphenoclea zeylanica* G*a*ertn*.* | Goose weed | Sphenocleaceae | 0.62 |
| *Monochoria vaginalis* (Burm.F.) C. Presl ex Kunth | Oval-leafed Pond Weed | Pontederiaceae | 1.04 |
| *Marsilea quadrifolia* L. | Four leaf clover | Marsileaceae | 0.56 |
| *Lindernia anagallis (Burm.f) Pennell* | Gadajvel | Linderniaceae | 7.49 |
| *Spirodela polyrhiza* (L.) | Giant duckweed | Araceae | 2.88 |

*The value in the parenthesis represents the % of different weed flora group infested the main rice crop*

**Supplementary Table 4 Weed flora infested the ratoon rice crop (averaged data of two years)**

|  |  |  |  |
| --- | --- | --- | --- |
| Scientific name | Common name | Family | Weed composition (%) |
| Grasses |  |  | (24.7) |
| *Echinochloa glabrescens* Munro ex Hook. f. | Cockspur Grass | Poaceae | 12.5 |
| *Leptochloa chinensis* (L.) Nees | Chinese Sprangletop | Poaceae | 5.5 |
| *Echinochloa crus-galli* (L.) P. Beauv. | Barn yard Grass | Poaceae | 4.2 |
| *Echinochloa colona* (L.) Link | Jungle Rice | Poaceae | 2.5 |
| Sedges |  |  | (7.5) |
| *Scirpus juncoides Roxb.* | Bulrush | Cyperaceae | 7.5 |
| Broad leaved weeds |  |  | (67.8) |
| *Ludwigia adscendes* (L.) Hara | Water Primose | Onagraceae | 22.5 |
| *Sphenoclea zeylanica* G*a*ertn*.* | Goose weed | Sphenocleaceae | 21.5 |
| *Monochoria vaginalis* (Burm.F.) C. Presl ex Kunth | Oval-leafed Pond Weed | Pontederiaceae | 18.5 |
| *Marsilea quadrifolia* L. | Four leaf clover | Marsileaceae | 5.3 |

*The value in the parenthesis represents the % of different weed flora group infested the ratoon rice crop*

**Supplementary Table 5: Visual toxicity of herbicides on rice crop (averaged data of two years)**

|  |  |  |  |
| --- | --- | --- | --- |
| Treatments | Visual toxicity rating of herbicides on rice crop | | |
| 7 DAA | 14 DAA | 21 DAA |
| T1: Azimsulfuron | 0.0 | 0.0 | 0.0 |
| T2: Flucetosulfuron | 0.0 | 0.0 | 0.0 |
| T3: Bispyribac sodium | 0.0 | 0.0 | 0.0 |
| T4: Bensulfuron-methyl + pretilachlor | 2.5 | 0.7 | 0.0 |
| T5: Azimsulfuron+bispyribac sodium | 0.0 | 0.0 | 0.0 |
| T6: Flucetosulfuron fb bispyribac sodium | 4.0 | 2.3 | 0.0 |
| T7: Manual weeding twice | 0.0 | 0.0 | 0.0 |
| T8: Paddy weeder fb manual weeding | 0.0 | 0.0 | 0.0 |
| T9: Weed free | 0.0 | 0.0 | 0.0 |
| T10: Weedy check | 0.0 | 0.0 | 0.0 |

DAA, days after application

**Supplementary Table 6: Levene's test for homogeneity of variances in between two years of observation**

|  |  |  |  |
| --- | --- | --- | --- |
| Parameters | F-ratio | *P*-value | Significance |
| *Main crop* | | | |
| Grain yield (t ha-1) | 0.65634 | 0.421166 | The result is not significant at p < 0.05. The requirement of homogeneity is met. |
| Panicles m-2 | 0.53701 | 0.466626 | The result is not significant at p < 0.05. The requirement of homogeneity is met. |
| Grains panicle-1 | 0.05499 | 0.81542 | The result is not significant at p < 0.05. The requirement of homogeneity is met. |
| Test weight (g) | 1.76828 | 0.188801 | The result is not significant at p < 0.05. The requirement of homogeneity is met. |
| *Ratoon crop* | | | |
| Grain yield (t ha-1) | 0.82565 | 0.367295 | The result is not significant at p < 0.05. The requirement of homogeneity is met. |
| Panicles m-2 | 0.01275 | 0.910489 | The result is not significant at p < 0.05. The requirement of homogeneity is met. |
| Grains panicle-1 | 0.00108 | 0.973962 | The result is not significant at p < 0.05. The requirement of homogeneity is met. |
| Test weight (g) | 0.66257 | 0.418985 | The result is not significant at p < 0.05. The requirement of homogeneity is met. |

**Supplementary Table 7: ANOVA table of grain yield (main and ratoon crops) in factorial RBD with weed management treatments (level 10) and years (level 2) as factors**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Parameter: Grain yield of main crop (t ha-1) | | | | | | | | | | | |
| ANOVA table | Df | Sum Sq | | Mean Sq | | F value | | | Pr(>F) | | Sig |
| Replication | 2 | 0.0073 | | 0.00366 | | 0.0697 | | | 0.93281 | |  |
| Weed management (wm) | 9 | 19.417 | | 2.15745 | | 41.0584 | | | < 2.2e-16 | | \*\*\* |
| Year (yr) | 1 | 1.855 | | 1.85504 | | 35.3033 | | | 6.85E-07 | | \*\*\* |
| wm × yr | 9 | 0.9745 | | 0.10828 | | 2.0607 | | | 0.05864 | | NS |
| Residuals | 38 | 1.9967 | | 0.05255 | |  | | |  | |  |
| Parameter: Grain yield of ratoon crop (t ha-1) | | | | | | | | | | | |
| ANOVA table | Df | | Sum Sq | | Mean Sq | | F value | Pr(>F) | | Sig | |
| Replication | 2 | | 0.09004 | | 0.04502 | | 2.057 | 0.141841 | |  | |
| Weed management (wm) | 9 | | 2.64136 | | 0.29348 | | 13.4093 | 2.47E-09 | | \*\*\* | |
| Year (yr) | 1 | | 0.31974 | | 0.31974 | | 14.6089 | 0.000477 | | \*\*\* | |
| wm × yr | 9 | | 0.02593 | | 0.00288 | | 0.1316 | 0.998515 | | NS | |
| Residuals | 38 | | 0.83169 | | 0.02189 | |  |  | |  | |

**Supplementary Table 8: Effect of weed control practices on grain yield (t ha-1)** **of wet direct sown rice-ratoon rice system**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Treatments | 2015 | | 2016 | |
| Main rice | Ratoon rice | Main rice | Ratoon rice |
| T1 | 5.50AB | 1.71ABC | 5.26BC | 1.59BC |
| T2 | 5.62AB | 1.79ABC | 5.22BC | 1.61BC |
| T3 | 5.55AB | 1.74ABC | 5.25BC | 1.55BC |
| T4 | 5.67AB | 1.82ABC | 5.42ABC | 1.64BC |
| T5 | 5.65AB | 1.61BC | 5.35ABC | 1.53BC |
| T6 | 5.38B | 1.57C | 5.27BC | 1.46C |
| T7 | 5.74AB | 1.92AB | 5.54AB | 1.71AB |
| T8 | 5.47AB | 1.71ABC | 4.97C | 1.57BC |
| T9 | 5.90A | 2.01A | 5.74A | 1.88A |
| T10 | 4.18C | 1.16D | 3.13D | 1.05D |
| Pr>F (Error df=18) | <0.000 | 0.001 | <0.000 | 0.0001 |

(*T1-Azimsulfuron, T2-Flucetosulfuron, T3-Bispyribac sodium, T4-Bensulfuron-methyl +pretilachlor, T5-Azimsulfuron+bispyribac sodium, T6-Flucetosulfuron followed by bispyribac sodium, T7-Manual weeding twice, T8-Paddy-weeder fb manual weeding, T9 -Weed free, T10-Weedy check*) *Means with at least one letter common are not statistically significant using Tukey Honestly Significant Difference (HSD) post-hoc test at P<0.05)*