**Table S1: Weather parameters during rice trials conducted during 2018-2019 at Gangtok, Sikkim**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Month** | **Tmax oC (mean)** | **Tmin**  **oC**  **(mean)** | **RH max (%)** | **RH min (%)** | **Rainfall**  **(mm) total** | **Sunshine (hrs) total** |
| June | 28.69 | 19.80 | 94.06 | 61.76 | 533.60 | 76.20 |
| July | 28.70 | 20.50 | 120.29 | 66.00 | 462.30 | 60.50 |
| August | 28.12 | 20.27 | 90.19 | 63.45 | 562.80 | 86.60 |
| Sept | 27.27 | 18.6 | 94.53 | 67.80 | 312.80 | 77.60 |
| Oct | 25.52 | 14.61 | 92.77 | 53.32 | 82.60 | 162.40 |
| Nov | 21.66 | 11.31 | 86.60 | 49.30 | 5.90 | 103.2 |

**Table S2: List of fifty local organic rice cultivars of Sikkim**

|  |  |
| --- | --- |
| **S No.** | **Entries** |
| 1 | TAKMARU (L) |
| 2 | KRISHNA BHOG |
| 3 | RAM SAREE |
| 4 | TABREY |
| 5 | ZORNALI |
| 6 | BRIHMPHOOL |
| 7 | TAKMARU |
| 8 | NEPAL DHAN |
| 9 | ZOKUB |
| 10 | TAULI |
| 11 | TIMBUREY |
| 12 | KALO DHAN |
| 13 | RED ZOMU |
| 14 | DUDHEY JUARI |
| 15 | KALEY BUNGEY |
| 16 | ANANDHI |
| 17 | DHUTRAJ |
| 18 | SIJALI |
| 19 | CHAMPEY |
| 20 | MARSEE |
| 21 | TULASI |
| 22 | CHARI MASINI |
| 23 | KHIMTI |
| 24 | JAPANI |
| 25 | CHINI DHAN |
| 26 | KATTI |
| 27 | RAMBHOG |
| 28 | CHARI NANGREY |
| 29 | KALO NUNIA |
| 30 | SANO KHAMTI |
| 31 | DOODH KALAM |
| 32 | SANO ATTEY |
| 33 | KATAKA |
| 34 | PAHELO DALLE |
| 35 | THULO ATTEY |
| 36 | PHOOL PATTA |
| 37 | LAL BACCHI |
| 38 | KALSATI |
| 39 | KHAMTI |
| 40 | TAICHUNG |
| 41 | JHAPAKA |
| 42 | ZOMU |
| 43 | YEIDEHI |
| 44 | CHIRAKEY |
| 45 | ATTEY |
| 46 | BAEL BUTTY |
| 47 | BHANGERI |
| 48 | MUSULI |
| 49 | PHOURYAL |
| 50 | RAM ZEERA |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Table S3:List of rice genotypes used for the study under organic system at Gangtok, Sikkim** | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |
| **A.** | **List of local rice cultivars of Sikkim** | | | |  |  |  |  |  |  |
| **S No** | **ENTRIES** |  |  |  |  |  |  |  |  |  |
| 1 | RED ZOMU | |  |  |  |  |  |  |  |  |
| 2 | KALO DHAN | |  |  |  |  |  |  |  |  |
| 3 | ZOKUB |  |  |  |  |  |  |  |  |  |
| 4 | TABREY | |  |  |  |  |  |  |  |  |
| 5 | CHINI DHAN | |  |  |  |  |  |  |  |  |
| 6 | NEPAL DHAN | |  |  |  |  |  |  |  |  |
| 7 | ZOMU |  |  |  |  |  |  |  |  |  |
| 8 | TAKMARU | |  |  |  |  |  |  |  |  |
| 9 | TAKMARU (L) | |  |  |  |  |  |  |  |  |
| 10 | TAICHUNG | |  |  |  |  |  |  |  |  |
| 11 | JHAPAKA | |  |  |  |  |  |  |  |  |
| 12 | KHAMTI | |  |  |  |  |  |  |  |  |
| 13 | KATTI |  |  |  |  |  |  |  |  |  |
| 14 | RAM SAREE | |  |  |  |  |  |  |  |  |
| 15 | DHUTRAJ | |  |  |  |  |  |  |  |  |
| 16 | KRISHNA BHOG | |  |  |  |  |  |  |  |  |
| 17 | MARSEE | |  |  |  |  |  |  |  |  |
| 18 | KATAKA | |  |  |  |  |  |  |  |  |
| 19 | RAMBHOG | |  |  |  |  |  |  |  |  |
| 20 | JAPANI |  |  |  |  |  |  |  |  |  |
| 21 | KALO NUNIA | |  |  |  |  |  |  |  |  |
| 22 | LAL BACCHI | |  |  |  |  |  |  |  |  |
| 23 | CHARI MASINI | |  |  |  |  |  |  |  |  |
| 24 | CHAMPEY | |  |  |  |  |  |  |  |  |
| 25 | DOODH KALAM | |  |  |  |  |  |  |  |  |
| 26 | PAHELO DALLE | |  |  |  |  |  |  |  |  |
| 27 | TAULI |  |  |  |  |  |  |  |  |  |
| 28 | BRIHMPHOOL | |  |  |  |  |  |  |  |  |
| 29 | DUDHEY JUARI | |  |  |  |  |  |  |  |  |
| 30 | KALEY BUNGEY | |  |  |  |  |  |  |  |  |
| 31 | BAEL BUTTY | |  |  |  |  |  |  |  |  |
| 32 | SANO ATTEY | |  |  |  |  |  |  |  |  |
| 33 | KALSATI | |  |  |  |  |  |  |  |  |
| 34 | PHOURYAL | |  |  |  |  |  |  |  |  |
| 35 | TIMBUREY | |  |  |  |  |  |  |  |  |
| 36 | THULO ATTEY | |  |  |  |  |  |  |  |  |
| 37 | TULASI |  |  |  |  |  |  |  |  |  |
| 38 | SIJALI |  |  |  |  |  |  |  |  |  |
| 39 | KHIMTI |  |  |  |  |  |  |  |  |  |
| 40 | BHANGERI | |  |  |  |  |  |  |  |  |
| 41 | ANANDHI | |  |  |  |  |  |  |  |  |
| 42 | PHOOL PATTA | |  |  |  |  |  |  |  |  |
| 43 | CHARI NANGREY | | |  |  |  |  |  |  |  |
| 44 | YEIDEHI | |  |  |  |  |  |  |  |  |
| 45 | RAM ZEERA | |  |  |  |  |  |  |  |  |
| 46 | MUSULI |  |  |  |  |  |  |  |  |  |
| 47 | ZORNALI | |  |  |  |  |  |  |  |  |
| 48 | CHIRAKEY | |  |  |  |  |  |  |  |  |
| 49 | SANO KHAMTI | |  |  |  |  |  |  |  |  |
| 50 | ATTEY |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |
| **B** | **List of rice genotypes tested under low temperatures stress** | | | | | | |  |  |  |
| 1 | Tripura Khara Dhan 2 | | |  |  |  |  |  |  |  |
| 2 | Tripura Sharat Dhan | | |  |  |  |  |  |  |  |
| 3 | Tripura Nirog Dhan | | |  |  |  |  |  |  |  |
| 4 | Tripura Hakuchuk Dhan1 | | |  |  |  |  |  |  |  |
| 5 | Tripura Aush Dhan | |  |  |  |  |  |  |  |  |
| 6 | TRC-SMCT-23-202-B-29 | | |  |  |  |  |  |  |  |
| 7 | TRC-BN-29-35-B-B-B-3 | | |  |  |  |  |  |  |  |
| 8 | TRC-PSM-353-170-B-B-7 | | |  |  |  |  |  |  |  |
| 9 | TRC-2014-8 | |  |  |  |  |  |  |  |  |
| 10 | TRC-BN-188-145-B-B-18 | | |  |  |  |  |  |  |  |
| 11 | TRC-2017-32 | |  |  |  |  |  |  |  |  |
| 12 | TRC-2017-5 | |  |  |  |  |  |  |  |  |
| 13 | TRC BN-803-372-B-B-18 | | |  |  |  |  |  |  |  |
| 14 | TRC-2017-20 | |  |  |  |  |  |  |  |  |
| 15 | TRC-2017-3 | |  |  |  |  |  |  |  |  |
| 16 | TRC-2017-4 | |  |  |  |  |  |  |  |  |
| 17 | TRC-2017-46 | |  |  |  |  |  |  |  |  |
| 18 | TRC-2017-16 | |  |  |  |  |  |  |  |  |
| 19 | TRC-2017-18 | |  |  |  |  |  |  |  |  |
| 20 | TRC-2017-19 | |  |  |  |  |  |  |  |  |
| 21 | TRC-2017-37 | |  |  |  |  |  |  |  |  |
| 22 | TRC-2017-12 | |  |  |  |  |  |  |  |  |
| 23 | TRC-2017-2 | |  |  |  |  |  |  |  |  |
| 24 | TRC-2017-11 | |  |  |  |  |  |  |  |  |
| 25 | TRC-2017-13 | |  |  |  |  |  |  |  |  |
| 26 | TRC-2017-9 | |  |  |  |  |  |  |  |  |
| 27 | TRC-2017-2 | |  |  |  |  |  |  |  |  |
| 28 | TRC2016-1 | |  |  |  |  |  |  |  |  |
| 29 | TRC2016-7 | |  |  |  |  |  |  |  |  |
| 30 | TRC2016-4 | |  |  |  |  |  |  |  |  |
| 31 | TRC2016-3 | |  |  |  |  |  |  |  |  |
| 32 | TRC2016-6 | |  |  |  |  |  |  |  |  |
| 33 | TRC2016-9 | |  |  |  |  |  |  |  |  |
| 34 | TRC2015-15 | |  |  |  |  |  |  |  |  |
| 35 | TRC2015-20 | |  |  |  |  |  |  |  |  |
| 36 | TRC2015-1 | |  |  |  |  |  |  |  |  |
| 37 | TRC2015-3 | |  |  |  |  |  |  |  |  |
| 38 | TRC2015-18 | |  |  |  |  |  |  |  |  |
| 39 | TRC2015-21 | |  |  |  |  |  |  |  |  |
| 40 | TRC2015-19 | |  |  |  |  |  |  |  |  |
| 41 | TRC2015-22 | |  |  |  |  |  |  |  |  |
| 42 | TRC2015-13 | |  |  |  |  |  |  |  |  |
| 43 | TRC2015-23 | |  |  |  |  |  |  |  |  |
| 44 | TRC2015-10 | |  |  |  |  |  |  |  |  |
| 45 | TRC2015-12 | |  |  |  |  |  |  |  |  |
| 46 | TRC2015-5 | |  |  |  |  |  |  |  |  |
| 47 | TRC2015-8 | |  |  |  |  |  |  |  |  |
| 48 | THULLO ATTEY | |  |  |  |  |  |  |  |  |
| 49 | ZORNALLI | |  |  |  |  |  |  |  |  |
| 50 | JAPANI |  |  |  |  |  |  |  |  |  |
| 51 | KATAKA | |  |  |  |  |  |  |  |  |
| 52 | PHUDUNGEY | |  |  |  |  |  |  |  |  |
| 53 | HIMALAYAII | |  |  |  |  |  |  |  |  |
| 54 | KHIMTI |  |  |  |  |  |  |  |  |  |
| 55 | TABREY | |  |  |  |  |  |  |  |  |
| 56 | PUSA 6 |  |  |  |  |  |  |  |  |  |
| 57 | CHAMPEY | |  |  |  |  |  |  |  |  |
| 58 | IVT3608 |  |  |  |  |  |  |  |  |  |
| 59 | VL DHAN 85 | |  |  |  |  |  |  |  |  |
| 60 | VL DHAN 82 | |  |  |  |  |  |  |  |  |
| 61 | PUSA 5 |  |  |  |  |  |  |  |  |  |
| 62 | CHINA 988 | |  |  |  |  |  |  |  |  |
| 63 | HPR 1068 | |  |  |  |  |  |  |  |  |
| 64 | SIJALI |  |  |  |  |  |  |  |  |  |
| 65 | SANO ATTEY | |  |  |  |  |  |  |  |  |
| 66 | KALAMI | |  |  |  |  |  |  |  |  |
| 67 | CHIRAKEY | |  |  |  |  |  |  |  |  |
| 68 | HPU 741 |  |  |  |  |  |  |  |  |  |
| 69 | CHIRAKEY | |  |  |  |  |  |  |  |  |
| 70 | VL 82 |  |  |  |  |  |  |  |  |  |
| 71 | VL 86 |  |  |  |  |  |  |  |  |  |
| 72 | DHARMALI | |  |  |  |  |  |  |  |  |
| 73 | CAU RI |  |  |  |  |  |  |  |  |  |
| 74 | VL DHAN 158 | |  |  |  |  |  |  |  |  |
| 75 | HIMALAYA | |  |  |  |  |  |  |  |  |
| 76 | HPR 2656 | |  |  |  |  |  |  |  |  |
| 77 | RC Maniphou 11 | |  |  |  |  |  |  |  |  |
| 78 | HPR 288 |  |  |  |  |  |  |  |  |  |
| 79 | VL 68 |  |  |  |  |  |  |  |  |  |
| 80 | VL 206 |  |  |  |  |  |  |  |  |  |
| 81 | PD 12 |  |  |  |  |  |  |  |  |  |
| 82 | HPU 2216 | |  |  |  |  |  |  |  |  |
| 83 | VL 85 |  |  |  |  |  |  |  |  |  |
| 84 | VL 62 |  |  |  |  |  |  |  |  |  |
| 85 | KHIMTI |  |  |  |  |  |  |  |  |  |
| 86 | HIMALAYA II | |  |  |  |  |  |  |  |  |
| 87 | HPR 1156 | |  |  |  |  |  |  |  |  |
| 88 | TABREY | |  |  |  |  |  |  |  |  |
| 89 | CHINI DHAN | |  |  |  |  |  |  |  |  |
| 90 | BRIGHU DHAN | |  |  |  |  |  |  |  |  |
| 91 | VL 156 |  |  |  |  |  |  |  |  |  |
| 92 | CHARINANAGREY | | |  |  |  |  |  |  |  |
| 93 | T 23 |  |  |  |  |  |  |  |  |  |
| 94 | HIM DHAN | |  |  |  |  |  |  |  |  |
| 95 | PALAM DHAN 957 | | |  |  |  |  |  |  |  |
| 96 | KASTURI | |  |  |  |  |  |  |  |  |
| 97 | ATTEY |  |  |  |  |  |  |  |  |  |
| 98 | CHINA 988 | |  |  |  |  |  |  |  |  |
| 99 | HPR 2612 | |  |  |  |  |  |  |  |  |
| 100 | VARUN DHAN | |  |  |  |  |  |  |  |  |
| 101 | RP 2421 |  |  |  |  |  |  |  |  |  |
| 102 | HPR 2795 | |  |  |  |  |  |  |  |  |
| 103 | HASSAN SARAI | |  |  |  |  |  |  |  |  |
| 104 | PHUDUNGEY | |  |  |  |  |  |  |  |  |
| 105 | VL 61 |  |  |  |  |  |  |  |  |  |
| 106 | PUSA 6 |  |  |  |  |  |  |  |  |  |
| 107 | HPR 2720 | |  |  |  |  |  |  |  |  |
| 108 | VL 16 |  |  |  |  |  |  |  |  |  |
| 109 | HPR 1068 | |  |  |  |  |  |  |  |  |
| 110 | ZORNALLI | |  |  |  |  |  |  |  |  |
| 111 | VL 39 |  |  |  |  |  |  |  |  |  |
| 112 | VL 81 |  |  |  |  |  |  |  |  |  |
| 113 | VL 65 |  |  |  |  |  |  |  |  |  |
| 114 | VL 209 |  |  |  |  |  |  |  |  |  |
| 115 | VL 208 |  |  |  |  |  |  |  |  |  |
| 116 | IVT 3608 | |  |  |  |  |  |  |  |  |
| 117 | NAGAR DHAN | |  |  |  |  |  |  |  |  |
| 118 | HPR 2143 | |  |  |  |  |  |  |  |  |
| 119 | VL 221 |  |  |  |  |  |  |  |  |  |
| 120 | ABHISHEK | |  |  |  |  |  |  |  |  |
| 121 | HPU 799 |  |  |  |  |  |  |  |  |  |
| 122 | VL DHAN 157 | |  |  |  |  |  |  |  |  |
| 123 | VL 207 |  |  |  |  |  |  |  |  |  |
| 124 | PUSA 5 |  |  |  |  |  |  |  |  |  |
| 125 | KATAKA | |  |  |  |  |  |  |  |  |
| 126 | LC4 |  |  |  |  |  |  |  |  |  |
| 127 | LC4 |  |  |  |  |  |  |  |  |  |
| 128 | SVIN391 | |  |  |  |  |  |  |  |  |
| 129 | SVIN391 | |  |  |  |  |  |  |  |  |
| 130 | SVIN353 | |  |  |  |  |  |  |  |  |
| 131 | SVIN353 | |  |  |  |  |  |  |  |  |
| 132 | LC2 |  |  |  |  |  |  |  |  |  |
| 133 | LC2 |  |  |  |  |  |  |  |  |  |
| 134 | SVIN354 | |  |  |  |  |  |  |  |  |
| 135 | SVIN354 | |  |  |  |  |  |  |  |  |
| 136 | LC3 |  |  |  |  |  |  |  |  |  |
| 137 | LC3 |  |  |  |  |  |  |  |  |  |
| 138 | LC5 |  |  |  |  |  |  |  |  |  |
| 139 | LC5 |  |  |  |  |  |  |  |  |  |
| 140 | SVIN391 | |  |  |  |  |  |  |  |  |
| 141 | SVIN015 | |  |  |  |  |  |  |  |  |
| 142 | LC1 |  |  |  |  |  |  |  |  |  |
| 143 | LC1 |  |  |  |  |  |  |  |  |  |
| 144 | SVIN350 | |  |  |  |  |  |  |  |  |
| 145 | SVIN008 | |  |  |  |  |  |  |  |  |
| 146 | SVIN008 | |  |  |  |  |  |  |  |  |
| 147 | SVIN009 | |  |  |  |  |  |  |  |  |
| 148 | SVIN009 | |  |  |  |  |  |  |  |  |
| 149 | SVIN358 | |  |  |  |  |  |  |  |  |
| 150 | SVIN315 | |  |  |  |  |  |  |  |  |
| 151 | SVIN357 | |  |  |  |  |  |  |  |  |
| 152 | SVIN372 | |  |  |  |  |  |  |  |  |
| 153 | SVIN333 | |  |  |  |  |  |  |  |  |
| 154 | SVIN304 | |  |  |  |  |  |  |  |  |
| 155 | SVIN306 | |  |  |  |  |  |  |  |  |
| 156 | SVIN321 | |  |  |  |  |  |  |  |  |
| 157 | SVIN056 | |  |  |  |  |  |  |  |  |
| 158 | SVIN314 | |  |  |  |  |  |  |  |  |
| 159 | SVIN346 | |  |  |  |  |  |  |  |  |
| 160 | SVIN309 | |  |  |  |  |  |  |  |  |
| 161 | LC2 |  |  |  |  |  |  |  |  |  |
| 162 | LC1 |  |  |  |  |  |  |  |  |  |
| 163 | SVIN352 | |  |  |  |  |  |  |  |  |
| 164 | SVIN049 | |  |  |  |  |  |  |  |  |
| 165 | SVIN327 | |  |  |  |  |  |  |  |  |
| 166 | SVIN052 | |  |  |  |  |  |  |  |  |
| 167 | SVIN340 | |  |  |  |  |  |  |  |  |
| 168 | SVIN316 | |  |  |  |  |  |  |  |  |
| 169 | SVIN323 | |  |  |  |  |  |  |  |  |
| 170 | SVIN329 | |  |  |  |  |  |  |  |  |
| 171 | SVIN324 | |  |  |  |  |  |  |  |  |
| 172 | SVIN308 | |  |  |  |  |  |  |  |  |
| 173 | SVIN022 | |  |  |  |  |  |  |  |  |
| 174 | SVIN290 | |  |  |  |  |  |  |  |  |
| 175 | SVIN355 | |  |  |  |  |  |  |  |  |
| 176 | LC5 |  |  |  |  |  |  |  |  |  |
| 177 | SVIN337 | |  |  |  |  |  |  |  |  |
| 178 | SVIN300 | |  |  |  |  |  |  |  |  |
| 179 | SVIN310 | |  |  |  |  |  |  |  |  |
| 180 | SVIN332 | |  |  |  |  |  |  |  |  |
| 181 | SVIN305 | |  |  |  |  |  |  |  |  |
| 182 | SVIN320 | |  |  |  |  |  |  |  |  |
| 183 | SVIN368 | |  |  |  |  |  |  |  |  |
| 184 | SVIN376 | |  |  |  |  |  |  |  |  |
| 185 | SVIN303 | |  |  |  |  |  |  |  |  |
| 186 | LC3 |  |  |  |  |  |  |  |  |  |
| 187 | SVIN344 | |  |  |  |  |  |  |  |  |
| 188 | SVIN287 | |  |  |  |  |  |  |  |  |
| 189 | LC4 |  |  |  |  |  |  |  |  |  |
| 190 | SVIN047 | |  |  |  |  |  |  |  |  |
| 191 | SVIN328 | |  |  |  |  |  |  |  |  |
| 192 | SVIN330 | |  |  |  |  |  |  |  |  |
| 193 | SVIN023 | |  |  |  |  |  |  |  |  |
| 194 | SVIN374 | |  |  |  |  |  |  |  |  |
| 195 | SVIN036 | |  |  |  |  |  |  |  |  |
| 196 | SVIN363 | |  |  |  |  |  |  |  |  |
| 197 | SVIN358 | |  |  |  |  |  |  |  |  |
| 198 | SVIN331 | |  |  |  |  |  |  |  |  |
| 199 | SVIN318 | |  |  |  |  |  |  |  |  |
| 200 | SVIN334 | |  |  |  |  |  |  |  |  |
| 201 | SVIN301 | |  |  |  |  |  |  |  |  |
| 202 | SVIN360 | |  |  |  |  |  |  |  |  |
| 203 | SVIN024 | |  |  |  |  |  |  |  |  |
| 204 | SVIN364 | |  |  |  |  |  |  |  |  |
| 205 | SVIN038 | |  |  |  |  |  |  |  |  |
| 206 | SVIN311 | |  |  |  |  |  |  |  |  |
| 207 | SVIN356 | |  |  |  |  |  |  |  |  |
| 208 | SVIN367 | |  |  |  |  |  |  |  |  |
| 209 | SVIN343 | |  |  |  |  |  |  |  |  |
| 210 | SVIN373 | |  |  |  |  |  |  |  |  |
| 211 | SVIN326 | |  |  |  |  |  |  |  |  |
| 212 | SVIN043 | |  |  |  |  |  |  |  |  |
| 213 | SVIN312 | |  |  |  |  |  |  |  |  |
| 214 | SVIN045 | |  |  |  |  |  |  |  |  |
| 215 | SVIN325 | |  |  |  |  |  |  |  |  |
| 216 | SVIN375 | |  |  |  |  |  |  |  |  |
| 217 | SVIN307 | |  |  |  |  |  |  |  |  |
| 218 | SVIN054 | |  |  |  |  |  |  |  |  |
| 219 | SVIN365 | |  |  |  |  |  |  |  |  |
| 220 | SVIN313 | |  |  |  |  |  |  |  |  |
| 221 | SVIN350 | |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |
| **C** | **List of rice genotypes tested under timely & late sown conditions** | | | | | | |  |  |  |
| 1 | HPR1156 | |  |  |  |  |  |  |  |  |
| 2 | VL 221 |  |  |  |  |  |  |  |  |  |
| 3 | HPR1068 | |  |  |  |  |  |  |  |  |
| 4 | VARUN DHAN | |  |  |  |  |  |  |  |  |
| 5 | HPR 2612 | |  |  |  |  |  |  |  |  |
| 6 | HPU 799 |  |  |  |  |  |  |  |  |  |
| 7 | HPR 288 |  |  |  |  |  |  |  |  |  |
| 8 | HIMLALAYAII | |  |  |  |  |  |  |  |  |
| 9 | HPR 2720 | |  |  |  |  |  |  |  |  |
| 10 | BRIGHU DHAN | |  |  |  |  |  |  |  |  |
| 11 | KASTURI | |  |  |  |  |  |  |  |  |
| 12 | PUSA 5 |  |  |  |  |  |  |  |  |  |
| 13 | T 23 |  |  |  |  |  |  |  |  |  |
| 14 | HPR 2656 | |  |  |  |  |  |  |  |  |
| 15 | HASAN SARAI | |  |  |  |  |  |  |  |  |
| 16 | HPR 2795 | |  |  |  |  |  |  |  |  |
| 17 | HPU 2216 | |  |  |  |  |  |  |  |  |
| 18 | CHINA 988 | |  |  |  |  |  |  |  |  |
| 19 | HIM DHAN | |  |  |  |  |  |  |  |  |
| 20 | ABHISHEK | |  |  |  |  |  |  |  |  |
| 21 | RP 2421 |  |  |  |  |  |  |  |  |  |
| 22 | HPR 2143 | |  |  |  |  |  |  |  |  |
| 23 | PALAM DHAN 957 | | |  |  |  |  |  |  |  |
| 24 | HIMALAYA I | |  |  |  |  |  |  |  |  |
| 25 | SANO ATTEY | |  |  |  |  |  |  |  |  |
| 26 | HPU 741 |  |  |  |  |  |  |  |  |  |
| 27 | CHIRAKEY | |  |  |  |  |  |  |  |  |
| 28 | NAGAR DHAN | |  |  |  |  |  |  |  |  |
| 29 | PD 12 |  |  |  |  |  |  |  |  |  |
| 30 | CAU RI |  |  |  |  |  |  |  |  |  |
| 31 | JAPANI |  |  |  |  |  |  |  |  |  |
| 32 | CHARI NANGREY | | |  |  |  |  |  |  |  |
| 33 | THULO ATTEY | |  |  |  |  |  |  |  |  |
| 34 | CHINI DHAN | |  |  |  |  |  |  |  |  |
| 35 | PD10 |  |  |  |  |  |  |  |  |  |
| 36 | PHUDUNGEY | |  |  |  |  |  |  |  |  |
| 37 | KHIMTI |  |  |  |  |  |  |  |  |  |
| 38 | DHARMALI | |  |  |  |  |  |  |  |  |
| 39 | ZORNALLI | |  |  |  |  |  |  |  |  |
| 40 | CHAMPEY | |  |  |  |  |  |  |  |  |
| 41 | PUSA 6 |  |  |  |  |  |  |  |  |  |
| 42 | TABREY | |  |  |  |  |  |  |  |  |
| 43 | VL DHAN 207 | |  |  |  |  |  |  |  |  |
| 44 | VL DHAN 82 | |  |  |  |  |  |  |  |  |
| 45 | VL DHAN 39 | |  |  |  |  |  |  |  |  |
| 46 | VL DHAN 62 | |  |  |  |  |  |  |  |  |
| 47 | VL DHAN 16 | |  |  |  |  |  |  |  |  |
| 48 | VL DHAN 208 | |  |  |  |  |  |  |  |  |
| 49 | VL DHAN 158 | |  |  |  |  |  |  |  |  |
| 50 | VL DHAN 154 | |  |  |  |  |  |  |  |  |
| 51 | VL DHAN 157 | |  |  |  |  |  |  |  |  |
| 52 | VL DHAN 86 | |  |  |  |  |  |  |  |  |
| 53 | VL DHAN 209 | |  |  |  |  |  |  |  |  |
| 54 | VL DHAN 85 | |  |  |  |  |  |  |  |  |
| 55 | VL DHAN 61 | |  |  |  |  |  |  |  |  |
| 56 | VL DHAN 81 | |  |  |  |  |  |  |  |  |
| 57 | VL DHAN 68 | |  |  |  |  |  |  |  |  |
| 58 | VL DHAN 206 | |  |  |  |  |  |  |  |  |
| 59 | VL DHAN 65 | |  |  |  |  |  |  |  |  |
| 60 | VL DHAN 221 | |  |  |  |  |  |  |  |  |
| 61 | VL DHAN 156 | |  |  |  |  |  |  |  |  |
| 62 | KATAKA | |  |  |  |  |  |  |  |  |
| 63 | IVT 3608 | |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |
| **D** | **List of genotypes evaluated under trials for system × variety interaction** | | | | | |  |  |  |  |
| 1 | IET 26580 | |  |  |  |  |  |  |  |  |
| 2 | 26594 |  |  |  |  |  |  |  |  |  |
| 3 | 26597 |  |  |  |  |  |  |  |  |  |
| 4 | VIVEK DHAN 62 | |  |  |  |  |  |  |  |  |
| 5 | 26591 |  |  |  |  |  |  |  |  |  |
| 6 | 26588 |  |  |  |  |  |  |  |  |  |
| 7 | ZC |  |  |  |  |  |  |  |  |  |
| 8 | 26579 |  |  |  |  |  |  |  |  |  |
| 9 | 26596 |  |  |  |  |  |  |  |  |  |
| 10 | LC |  |  |  |  |  |  |  |  |  |
| 11 | 27483 |  |  |  |  |  |  |  |  |  |
| 12 | 27491 |  |  |  |  |  |  |  |  |  |
| 13 | 27494 |  |  |  |  |  |  |  |  |  |
| 14 | VIVEK DHAN 62 | |  |  |  |  |  |  |  |  |
| 15 | 27486 |  |  |  |  |  |  |  |  |  |
| 16 | 27488 |  |  |  |  |  |  |  |  |  |
| 17 | 27485 |  |  |  |  |  |  |  |  |  |
| 18 | VL DHAN 65 | |  |  |  |  |  |  |  |  |
| 19 | 27496 |  |  |  |  |  |  |  |  |  |
| 20 | 27479 |  |  |  |  |  |  |  |  |  |
| 21 | LC |  |  |  |  |  |  |  |  |  |
| 22 | 28208 |  |  |  |  |  |  |  |  |  |
| 23 | 28209 |  |  |  |  |  |  |  |  |  |
| 24 | 28210 |  |  |  |  |  |  |  |  |  |
| 25 | 28211 |  |  |  |  |  |  |  |  |  |
| 26 | 28212 |  |  |  |  |  |  |  |  |  |
| 27 | NC |  |  |  |  |  |  |  |  |  |
| 28 | 28213 |  |  |  |  |  |  |  |  |  |
| 29 | 28214 |  |  |  |  |  |  |  |  |  |
| 30 | 28215 |  |  |  |  |  |  |  |  |  |
| 31 | 28216 |  |  |  |  |  |  |  |  |  |
| 32 | 28217 |  |  |  |  |  |  |  |  |  |
| 33 | 28218 |  |  |  |  |  |  |  |  |  |
| 34 | 28219 |  |  |  |  |  |  |  |  |  |
| 35 | VL-65 |  |  |  |  |  |  |  |  |  |
| 36 | 28220 |  |  |  |  |  |  |  |  |  |
| 37 | 28221 |  |  |  |  |  |  |  |  |  |
| 38 | 28222 |  |  |  |  |  |  |  |  |  |
| 39 | 28223 |  |  |  |  |  |  |  |  |  |
| 40 | 28224 |  |  |  |  |  |  |  |  |  |
| 41 | 28225 |  |  |  |  |  |  |  |  |  |
| 42 | 28226 |  |  |  |  |  |  |  |  |  |
| 43 | 28227 |  |  |  |  |  |  |  |  |  |
| 44 | LC |  |  |  |  |  |  |  |  |  |
| 45 | 2018 |  |  |  |  |  |  |  |  |  |
| 46 | 25830 |  |  |  |  |  |  |  |  |  |
| 47 | 25841 |  |  |  |  |  |  |  |  |  |
| 48 | 25833 |  |  |  |  |  |  |  |  |  |
| 49 | 25838 |  |  |  |  |  |  |  |  |  |
| 50 | 25832 |  |  |  |  |  |  |  |  |  |
| 51 | 25836 |  |  |  |  |  |  |  |  |  |
| 52 | VIVEK DHAN62 |  |  |  |  |  |  |  |  |  |
| 53 | 26591 |  |  |  |  |  |  |  |  |  |
| 54 | 26579 |  |  |  |  |  |  |  |  |  |
| 55 | 26580 |  |  |  |  |  |  |  |  |  |
| 56 | 26585 |  |  |  |  |  |  |  |  |  |
| 57 | ZC |  |  |  |  |  |  |  |  |  |
| 58 | 26594 |  |  |  |  |  |  |  |  |  |
| 59 | 26588 |  |  |  |  |  |  |  |  |  |
| 60 | 26578 |  |  |  |  |  |  |  |  |  |
| 61 | 26597 |  |  |  |  |  |  |  |  |  |
| 62 | 26582 |  |  |  |  |  |  |  |  |  |
| 63 | 26596 |  |  |  |  |  |  |  |  |  |
| 64 | LC |  |  |  |  |  |  |  |  |  |
| 65 | 27478 |  |  |  |  |  |  |  |  |  |
| 66 | 27479 |  |  |  |  |  |  |  |  |  |
| 67 | 27480 |  |  |  |  |  |  |  |  |  |
| 68 | 27481 |  |  |  |  |  |  |  |  |  |
| 69 | 27482 |  |  |  |  |  |  |  |  |  |
| 70 | VIV 62 |  |  |  |  |  |  |  |  |  |
| 71 | 27483 |  |  |  |  |  |  |  |  |  |
| 72 | 27484 |  |  |  |  |  |  |  |  |  |
| 73 | 27485 |  |  |  |  |  |  |  |  |  |
| 74 | ZC |  |  |  |  |  |  |  |  |  |
| 75 | 27486 |  |  |  |  |  |  |  |  |  |
| 76 | 27487 |  |  |  |  |  |  |  |  |  |
| 77 | 27488 |  |  |  |  |  |  |  |  |  |
| 78 | 27489 |  |  |  |  |  |  |  |  |  |
| 79 | 27490 |  |  |  |  |  |  |  |  |  |
| 80 | 27491 |  |  |  |  |  |  |  |  |  |
| 81 | 27492 |  |  |  |  |  |  |  |  |  |
| 82 | 27493 |  |  |  |  |  |  |  |  |  |
| 83 | 27494 |  |  |  |  |  |  |  |  |  |
| 84 | 27495 |  |  |  |  |  |  |  |  |  |
| 85 | 27496 |  |  |  |  |  |  |  |  |  |
| 86 | LC |  |  |  |  |  |  |  |  |  |

**Table S4a: ANOVA table for agro morphological traits under irrigated lowland conditions (Block adjusted)**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Source of variation | df | Days to flowering | Plant height | No. of tillers | Panicle length | Days to maturity | Yield per plant | Test weight |
| Block (eliminating treatments) | 4 | 3.249 | 68.266 | 1.798 | 1.583 | 9.831 | 9591.121 | 0.321 |
| Treatments  (ignoring blocks) | 53 | 122.220\*\* | 1028.219\*\* | 7.010\*\* | 4.783\*\* | 166.253\*\* | 30592.773\*\* | 13.301\*\* |
| Checks | 3 | 303.467\*\* | 2799.744\*\* | 14.360\*\* | 6.781\*\* | 128.733\*\* | 58026.442\*\* | 18.429\*\* |
| Varieties | 49 | 100.216\*\* | 511.732\*\*\*\* | 6.613\*\* | 3.342\*\* | 166.502\*\* | 28730.637\*\* | 12.157\*\* |
| C vs V | 1 | 656.691\*\* | 21021.481 | 4.417 | 69.390\*\* | 266.606\*\* | 39536.421\*\* | 53.982\*\* |
| Error | 12 | 3.884\*\* | 36.798\*\* | 1.643 | 0.666 | 7.356\*\* | 7316.500\* | 0.319\*\* |
| Total | 69 |  |  |  |  |  |  |  |

**Table S4b: ANOVA table for agro morphological traits under upland conditions (Block adjusted)**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Source of variation | df | Days to flowering | Plant height | No. of tillers | Panicle length | Days to maturity | Yield per plant | Test weight |
| Block (eliminating treatments) | 4 | 3.828 | 127.385\* | 1.493 | 0.767 | 30.206 | 9321.895\* | 0.215 |
| Treatments  (ignoring blocks) | 53 | 131.869\*\* | 679.216\*\* | 3.681\*\* | 5.604\*\* | 145.249\*\* | 19392.173\*\* | 11.411\*\* |
| Checks | 3 | 73.250\*\* | 939.949\*\* | 20.616\*\* | 0.983 | 56.333 | 60872.748\*\* | 45.727\*\* |
| Varieties | 49 | 119.443\*\* | 286.443\*\* | 2.717\* | 4.678\*\* | 151.171 | 15948.092\*\* | 9.171\*\* |
| C vs V | 1 | 916.573\*\* | 19142.922\*\* | 0.143 | 64.818\*\* | 121.806\* | 63710.426\*\* | 18.218\*\* |
| Error | 12 | 7.124\*\* | 38.053\*\* | 0.821 | 0.934 | 24.665 | 2855.206\*\* | 0.785\*\* |
| Total | 69 |  |  |  |  |  |  |  |

**Table S5: Percent reduction/increase in trait values of local organic rice landraces under direct seeded rainfed upland conditions**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **S No.** | **Entries** | **Plant height (cm)** | **Days to flowering** | **No. of tillers** | **Panicle length (cm)** | **Days to maturity** | **Yield per plant (g)** | **1000 seed weight (g)** |
| 1 | TAKMARU (L) | + 6.92 | -10.64 | +5.88 | +10.07 | +3.42 | +10.00 | -4.42 |
| 2 | KRISHNA BHOG | -33.06 | 0.00 | -31.43 | -8.15 | -3.05 | +71.13 | -15.15 |
| 3 | RAM SAREE | -4.78 | -4.46 | -2.44 | +0.74 | -1.35 | +2.85 | -1.90 |
| 4 | TABREY | -11.06 | -5.95 | +2.78 | +2.27 | -2.22 | +44.42 | -17.07 |
| 5 | ZORNALI | -15.34 | -6.82 | 0.00 | -3.85 | -12.33 | -73.42 | +4.43 |
| 6 | BRIHMPHOOL | - 16.16 | +1.67 | -19.05 | 0.00 | -4.32 | -19.92 | -9.55 |
| 7 | TAKMARU | + 3.43 | +4.27 | -13.16 | +2.31 | -2.74 | -24.37 | +14.01 |
| 8 | NEPAL DHAN | -10.87 | 0.00 | -92.00 | +8.46 | -2.16 | -0.08 | -13.50 |
| 9 | ZOKUB | + 4.85 | -1.82 | -5.56 | +3.88 | -2.80 | -5.00 | -6.24 |
| 10 | TAULI | -17.67 | -1.82 | -38.30 | -5.47 | -3.52 | -89.07 | -15.24 |
| 11 | TIMBUREY | -11.73 | 0.00 | 0.00 | +2.34 | -0.68 | -100.57 | -4.62 |
| 12 | KALO DHAN | +13.17 | 0.00 | -56.67 | +2.38 | +1.57 | -55.77 | -5.81 |
| 13 | RED ZOMU | +16.38 | +3.30 | -35.14 | +3.60 | +3.20 | -58.81 | -11.68 |
| 14 | DUDHEY JUARI | -13.43 | +4.55 | -24.39 | -8.06 | +11.11 | -178.21 | -24.96 |
| 15 | KALEY BUNGEY | -19.38 | +4.27 | -105.71 | -6.50 | +2.00 | -113.47 | -4.00 |
| 16 | ANANDHI | -2.80 | 0.00 | 0.00 | +6.50 | 0.00 | -60.66 | -15.67 |
| 17 | DHUTRAJ | -29.75 | -0.86 | -83.33 | -14.75 | -0.62 | -22.39 | -13.76 |
| 18 | SIJALI | -21.46 | 0.89 | -151.85 | -11.57 | -7.89 | -46.52 | -0.16 |
| 19 | CHAMPEY | -16.57 | +2.48 | -21.74 | -7.44 | +3.55 | +58.44 | -2.93 |
| 20 | MARSEE | -14.99 | 0.00 | -8.51 | -2.50 | -10.81 | -8.55 | +4.52 |
| 21 | TULASI | -73.58 | 0.85 | -61.76 | -15.13 | 0.67 | -138.56 | -0.54 |
| 22 | CHARI MASINI | -5.29 | +5.88 | -11.11 | -2.54 | -1.37 | -37.53 | -14.53 |
| 23 | KHIMTI | -49.88 | +0.84 | -6.82 | 0.00 | -3.05 | +36.77 | -19.89 |
| 24 | JAPANI | -24.66 | +1.69 | -94.29 | -15.52 | +2.50 | -499.15 | -8.10 |
| 25 | CHINI DHAN | -21.16 | +3.45 | -57.78 | -13.79 | -0.68 | -21.67 | -12.49 |
| 26 | KATTI | -19.25 | -0.84 | -106.45 | +1.72 | +4.14 | +8.33 | -18.10 |
| 27 | RAMBHOG | -36.01 | +1.67 | -28.95 | -18.26 | -9.33 | -99.45 | +0.52 |
| 28 | CHARI NANGREY | -41.04 | +3.31 | -3.85 | -6.96 | -10.53 | -72.45 | -9.77 |
| 29 | KALO NUNIA | -16.17 | -2.34 | 0.00 | -6.09 | -2.15 | +67.50 | -6.44 |
| 30 | SANO KHAMTI | -32.76 | -11.43 | +13.73 | +0.87 | -3.05 | +43.31 | -8.99 |
| 31 | DOODH KALAM | -14.19 | -4.26 | -8.89 | -8.77 | -5.04 | -175.21 | -16.68 |
| 32 | SANO ATTEY | -7.53 | +4.27 | +26.00 | +10.53 | +0.68 | +1.14 | -1.28 |
| 33 | KATAKA | -21.70 | 0.00 | +12.24 | -18.58 | -3.80 | -111.90 | -2.35 |
| 34 | PAHELO DALLE | -12.28 | -4.17 | -22.22 | -12.39 | -1.43 | -54.37 | -5.49 |
| 35 | THULO ATTEY | -26.12 | +11.71 | -48.57 | -12.39 | -2.78 | -16.98 | +3.57 |
| 36 | PHOOL PATTA | -20.74 | +0.85 | -1.69 | -19.64 | +1.33 | -156.43 | -6.21 |
| 37 | LAL BACCHI | -12.79 | +1.65 | -17.07 | -10.71 | 0.00 | +11.86 | -8.29 |
| 38 | KALSATI | -4.79 | 0.00 | +18.00 | -0.89 | -11.33 | -86.41 | -8.90 |
| 39 | KHAMTI | -9.65 | -0.84 | -8.16 | -15.32 | -1.25 | -38.40 | -19.05 |
| 40 | TAICHUNG | + 0.45 | +1.10 | -21.95 | 0.00 | 0.00 | -62.53 | -12.55 |
| 41 | JHAPAKA | -22.09 | +0.85 | -40.38 | -4.63 | 0.00 | -835.38 | -19.89 |
| 42 | ZOMU | -11.96 | 0.00 | -32.56 | -10.28 | -14.40 | -100.52 | -3.20 |
| 43 | YEIDEHI | -41.70 | +2.06 | -65.85 | -14.15 | +9.88 | -137.36 | -7.57 |
| 44 | CHIRAKEY | -31.81 | -6.67 | +32.73 | -27.62 | +3.27 | -53.88 | -24.19 |
| 45 | ATTEY | -45.28 | +1.79 | -136.84 | -28.85 | -5.56 | -251.49 | +1.51 |
| 46 | BAEL BUTTY | -1.35 | 0.00 | -9.80 | -8.65 | -1.23 | -31.51 | -1.03 |
| 47 | BHANGERI | -47.81 | +4.27 | -120.93 | -31.37 | +1.35 | -546.25 | -5.13 |
| 48 | MUSULI | -38.82 | +0.84 | -103.13 | -27.55 | -9.46 | -223.36 | -15.12 |
| 49 | PHOURYAL | -12.27 | +1.69 | -75.76 | -19.39 | +1.23 | -243.40 | -3.92 |
| 50 | RAM ZEERA | -47.63 | +1.68 | -21.05 | -16.84 | +6.17 | -72.79 | -11.75 |
| 51 | Check 1 (PD-10) | -14.22 | -1.49 | -35.62 | +0.47 | -2.67 | -87.67 | -13.91 |
| 52 | Check 2 (RCPL-123) | -19.41 | +0.23 | -11.94 | -14.06 | -1.58 | -79.17 | -7.37 |
| 53 | Check 3 (Bhalum-3) | -29.36 | -2.29 | -4.08 | -7.84 | -5.82 | -7.15 | -4.86 |
| 54 | Check 4 (RCPL-469) | -10.16 | -8.22 | -12.72 | -7.11 | -1.16 | -85.28 | -21.66 |

**Table S6: Relative mean values for different traits under irrigated (IR) and upland conditions (UL) at Sikkim midhills**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SNo | Variety | PH  (IR) | PH  (UL) | DF (IR) | DF  (UL) | NOT  (IR) | NOT  (UL) | PL  (IR) | PL  (UL) | DM  (IR) | DM  (UL) | YPP  (IR) | YPP  (UL) | TW  (IR) | TW  (UL) |
| 1 | TAKMARU LOWLAND | 83.40 | 89.60 | 104.00 | 94.00 | 9.60 | 10.20 | 26.80 | 29.80 | 141.00 | 146.00 | 569.40 | 632.70 | 22.42 | 21.47 |
| 2 | CHAMPEY | 115.40 | 99.00 | 118.00 | 121.00 | 11.20 | 9.20 | 26.00 | 24.20 | 163.00 | 169.00 | 223.70 | 538.20 | 22.85 | 22.20 |
| 3 | SANO KHAMTI | 123.20 | 92.80 | 117.00 | 105.00 | 8.80 | 10.20 | 22.80 | 23.00 | 169.00 | 164.00 | 291.80 | 514.70 | 22.31 | 20.47 |
| 4 | TAKMARU | 118.20 | 122.40 | 112.00 | 117.00 | 8.60 | 7.60 | 25.40 | 26.00 | 150.00 | 146.00 | 554.20 | 445.60 | 20.62 | 23.98 |
| 5 | TAICHUNG | 89.20 | 89.60 | 90.00 | 91.00 | 10.00 | 8.20 | 22.20 | 22.20 | 123.00 | 123.00 | 684.40 | 421.10 | 26.00 | 23.10 |
| 6 | PAHELO DALLE | 113.40 | 101.00 | 100.00 | 96.00 | 11.00 | 9.00 | 25.40 | 22.60 | 142.00 | 140.00 | 630.00 | 408.10 | 23.43 | 22.21 |
| 7 | ZOKUB | 129.60 | 136.20 | 112.00 | 110.00 | 7.60 | 7.20 | 24.80 | 25.80 | 147.00 | 143.00 | 428.40 | 408.00 | 18.06 | 17.00 |
| 8 | NEPAL DHAN | 120.40 | 108.60 | 100.00 | 100.00 | 9.60 | 5.00 | 23.80 | 26.00 | 142.00 | 139.00 | 372.40 | 372.10 | 24.97 | 22.00 |
| 9 | KHIMTI | 122.00 | 81.40 | 118.00 | 119.00 | 9.40 | 8.80 | 23.40 | 23.40 | 169.00 | 164.00 | 233.50 | 369.30 | 24.29 | 20.26 |
| 10 | LAL BACCHI | 127.00 | 112.60 | 119.00 | 121.00 | 9.60 | 8.20 | 24.80 | 22.40 | 146.00 | 146.00 | 310.50 | 352.30 | 25.34 | 23.40 |
| 11 | DHUTRAJ | 166.60 | 128.40 | 117.00 | 116.00 | 8.80 | 4.80 | 28.00 | 24.40 | 162.00 | 161.00 | 383.70 | 313.50 | 26.21 | 23.04 |
| 12 | RAM SAREE | 135.80 | 129.60 | 117.00 | 112.00 | 8.40 | 8.20 | 26.80 | 27.00 | 150.00 | 148.00 | 303.60 | 312.50 | 17.19 | 16.87 |
| 13 | KALEY BUNGEY | 145.40 | 121.80 | 112.00 | 117.00 | 14.40 | 7.00 | 26.20 | 24.60 | 147.00 | 150.00 | 663.90 | 311.00 | 17.42 | 16.75 |
| 14 | KRISHNA BHOG | 164.20 | 123.40 | 117.00 | 117.00 | 9.20 | 7.00 | 29.20 | 27.00 | 169.00 | 164.00 | 89.30 | 309.30 | 22.12 | 19.21 |
| 15 | BRIHMPHOOL | 136.60 | 117.60 | 118.00 | 120.00 | 10.00 | 8.40 | 26.00 | 26.00 | 169.00 | 162.00 | 354.00 | 295.20 | 19.15 | 17.48 |
| 16 | CHARI MASINI | 119.40 | 113.40 | 112.00 | 119.00 | 10.00 | 9.00 | 24.20 | 23.60 | 148.00 | 146.00 | 393.60 | 286.20 | 23.57 | 20.58 |
| 17 | SANO ATTEY | 125.60 | 116.80 | 112.00 | 117.00 | 7.40 | 10.00 | 20.40 | 22.80 | 147.00 | 148.00 | 276.80 | 280.00 | 17.42 | 17.20 |
| 18 | ANANDHI | 110.20 | 107.20 | 119.00 | 119.00 | 6.40 | 6.40 | 23.00 | 24.60 | 152.00 | 152.00 | 440.70 | 274.30 | 33.00 | 28.53 |
| 19 | BAEL BUTTY | 105.20 | 103.80 | 121.00 | 121.00 | 11.20 | 10.20 | 22.60 | 20.80 | 164.00 | 162.00 | 332.60 | 252.90 | 20.66 | 20.45 |
| 20 | CHIRAKEY | 138.40 | 105.00 | 112.00 | 105.00 | 7.40 | 11.00 | 26.80 | 21.00 | 148.00 | 153.00 | 384.70 | 250.00 | 26.08 | 21.00 |
| 21 | KALSATI | 122.40 | 116.80 | 118.00 | 118.00 | 8.20 | 10.00 | 22.60 | 22.40 | 167.00 | 150.00 | 462.30 | 248.00 | 28.01 | 25.72 |
| 22 | TAULI | 151.80 | 129.00 | 112.00 | 110.00 | 13.00 | 9.40 | 27.00 | 25.60 | 147.00 | 142.00 | 467.00 | 247.00 | 24.27 | 21.06 |
| 23 | DUDHEY JUARI | 140.20 | 123.60 | 105.00 | 110.00 | 10.20 | 8.20 | 26.80 | 24.80 | 144.00 | 162.00 | 637.10 | 229.00 | 27.89 | 22.32 |
| 24 | CHINI DHAN | 134.00 | 110.60 | 112.00 | 116.00 | 14.20 | 9.00 | 26.40 | 23.20 | 149.00 | 148.00 | 265.60 | 218.30 | 22.79 | 20.26 |
| 25 | KATTI | 120.20 | 100.80 | 120.00 | 119.00 | 12.80 | 6.20 | 22.80 | 23.20 | 162.00 | 169.00 | 194.80 | 212.50 | 21.08 | 17.85 |
| 26 | RAM ZEERA | 137.00 | 92.80 | 117.00 | 119.00 | 9.20 | 7.60 | 22.20 | 19.00 | 152.00 | 162.00 | 359.40 | 208.00 | 16.26 | 14.55 |
| 27 | YEIDEHI | 126.40 | 89.20 | 95.00 | 97.00 | 13.60 | 8.20 | 24.20 | 21.20 | 146.00 | 162.00 | 493.00 | 207.70 | 25.29 | 23.51 |
| 28 | CHARI NANGREY | 135.40 | 96.00 | 117.00 | 121.00 | 10.80 | 10.40 | 24.60 | 23.00 | 168.00 | 152.00 | 358.00 | 207.60 | 20.45 | 18.63 |
| 29 | KALO NUNIA | 116.40 | 100.20 | 131.00 | 128.00 | 11.80 | 11.80 | 24.40 | 23.00 | 190.00 | 186.00 | 65.00 | 200.00 | 16.87 | 15.85 |
| 30 | ZORNALI | 118.80 | 103.00 | 94.00 | 88.00 | 8.60 | 8.60 | 27.00 | 26.00 | 164.00 | 146.00 | 339.90 | 196.00 | 23.08 | 24.15 |
| 31 | TABREY | 142.60 | 128.40 | 89.00 | 84.00 | 7.00 | 7.20 | 25.80 | 26.40 | 138.00 | 135.00 | 108.50 | 195.20 | 27.98 | 23.90 |
| 32 | KHAMTI | 120.40 | 109.80 | 120.00 | 119.00 | 10.60 | 9.80 | 25.60 | 22.20 | 162.00 | 160.00 | 268.50 | 194.00 | 23.93 | 20.10 |
| 33 | PHOOL PATTA | 130.40 | 108.00 | 116.00 | 117.00 | 12.00 | 11.80 | 26.80 | 22.40 | 148.00 | 150.00 | 494.40 | 192.80 | 23.44 | 22.07 |
| 34 | TULASI | 214.20 | 123.40 | 116.00 | 117.00 | 11.00 | 6.80 | 27.40 | 23.80 | 148.00 | 149.00 | 443.00 | 185.70 | 20.62 | 20.51 |
| 35 | TIMBUREY | 133.40 | 119.40 | 116.00 | 116.00 | 8.60 | 8.60 | 25.00 | 25.60 | 149.00 | 148.00 | 353.00 | 176.00 | 22.41 | 21.42 |
| 36 | ATTEY | 150.80 | 103.80 | 110.00 | 112.00 | 18.00 | 7.60 | 26.80 | 20.80 | 152.00 | 144.00 | 601.40 | 171.10 | 20.92 | 21.24 |
| 37 | KALO DHAN | 135.80 | 156.40 | 95.00 | 95.00 | 9.40 | 6.00 | 24.60 | 25.20 | 125.00 | 127.00 | 259.20 | 166.40 | 24.59 | 23.24 |
| 38 | THULO ATTEY | 151.60 | 120.20 | 98.00 | 111.00 | 10.40 | 7.00 | 25.40 | 22.60 | 148.00 | 144.00 | 184.60 | 157.80 | 22.66 | 23.50 |
| 39 | SIJALI | 149.40 | 123.00 | 111.00 | 112.00 | 13.60 | 5.40 | 27.00 | 24.20 | 164.00 | 152.00 | 217.00 | 148.10 | 24.99 | 24.95 |
| 40 | RAMBHOG | 155.60 | 114.40 | 118.00 | 120.00 | 9.80 | 7.60 | 27.20 | 23.00 | 164.00 | 150.00 | 287.60 | 144.20 | 17.36 | 17.45 |
| 41 | JAPANI | 147.60 | 118.40 | 116.00 | 118.00 | 13.60 | 7.00 | 26.80 | 23.20 | 156.00 | 160.00 | 850.80 | 142.00 | 26.16 | 24.20 |
| 42 | PHOURYAL | 120.80 | 107.60 | 116.00 | 118.00 | 11.60 | 6.60 | 23.40 | 19.60 | 160.00 | 162.00 | 476.30 | 138.70 | 25.73 | 24.76 |
| 43 | RED ZOMU | 116.40 | 139.20 | 88.00 | 91.00 | 10.00 | 7.40 | 24.10 | 25.00 | 121.00 | 125.00 | 215.50 | 135.70 | 27.05 | 24.22 |
| 44 | MUSULI | 136.60 | 98.40 | 118.00 | 119.00 | 13.00 | 6.40 | 25.00 | 19.60 | 162.00 | 148.00 | 427.80 | 132.30 | 20.33 | 17.66 |
| 45 | ZOMU | 123.60 | 110.40 | 89.00 | 89.00 | 11.40 | 8.60 | 23.60 | 21.40 | 143.00 | 125.00 | 232.80 | 116.10 | 28.03 | 27.16 |
| 46 | KATAKA | 154.80 | 127.20 | 118.00 | 118.00 | 8.60 | 9.80 | 26.80 | 22.60 | 164.00 | 158.00 | 208.30 | 98.30 | 26.16 | 25.56 |
| 47 | DOODH KALAM | 66.00 | 57.80 | 98.00 | 94.00 | 9.80 | 9.00 | 24.80 | 22.80 | 146.00 | 139.00 | 229.80 | 83.50 | 25.74 | 22.06 |
| 48 | BHANGERI | 134.80 | 91.20 | 112.00 | 117.00 | 19.00 | 8.60 | 26.80 | 20.40 | 146.00 | 148.00 | 525.40 | 81.30 | 22.73 | 21.62 |
| 49 | MARSEE | 153.40 | 133.40 | 111.00 | 111.00 | 10.20 | 9.40 | 24.60 | 24.00 | 164.00 | 148.00 | 78.70 | 72.50 | 22.40 | 23.46 |
| 50 | JHAPAKA | 126.00 | 103.20 | 116.00 | 117.00 | 14.60 | 10.40 | 22.60 | 21.60 | 164.00 | 164.00 | 243.20 | 26.00 | 22.97 | 19.16 |
| 51 | C2 | 116.90 | 91.05 | 101.00 | 100.00 | 10.65 | 8.40 | 23.55 | 21.15 | 148.50 | 142.25 | 339.73 | 218.73 | 25.65 | 23.89 |
| 52 | C3 | 86.75 | 75.95 | 102.50 | 101.00 | 9.90 | 7.30 | 21.05 | 21.15 | 154.00 | 150.00 | 335.13 | 178.58 | 27.39 | 26.12 |
| 53 | C4 | 104.20 | 77.30 | 97.00 | 103.00 | 10.75 | 6.75 | 23.15 | 20.70 | 142.50 | 144.50 | 456.35 | 49.50 | 24.21 | 19.90 |
| 54 | C1 | 74.00 | 71.07 | 110.67 | 104.67 | 12.13 | 11.00 | 22.60 | 22.13 | 149.67 | 148.33 | 511.67 | 268.73 | 22.93 | 20.13 |

**Table S7: ANOVA of rice genotypes evaluated in RBD design under late sown conditions in Sikkim midhills**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Source of variation | df | Plant height(cm) | Panicles/m2 | Yield /m2(g) | Yield/panicle(g) |
| Treatments | 196 | 398.92\*\* | 18294\*\* | 25163.01\*\* | 0.268\*\* |
| Replication(block) | 1 | 607.55\* | 5647.18\* | 11804.60 | 0.536 |
| Error | 194 | 132.47 | 6931.639 | 10490.50 | 0.141 |
| Corrected total | 391 |  |  |  |  |
| CV |  | 19.91 | 23.15 | 25.46 | 29.55 |
| Root MSE |  | 11.50 | 83.25 | 102.42 | 0.37 |
| Mean |  | 57.79 | 359.63 | 184.65 | 0.54 |

\*\*: significant at 1% level and \* at 5% level of significance

**Table S8: Correlation coefficient among traits for low temperature under organic irrigated conditions**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Plant height | Panicles/m2 | Yield/panicle | Yield/hill | Yield/m2 |
| Plant height | 1 | 0.20\*\* | 0.07 | -0.05 | 0.14\* |
| Panicles/m2 |  | 1 | -0.14\* | 0.03 | 0.25\*\*\* |
| Yield/panicle |  |  | 1 | 0.84\*\*\* | 0.84\*\*\* |
| Yield/hill |  |  |  | 1 | 0.96\*\*\* |
| Yield/m2 |  |  |  |  | 1 |

\*p<0.05, \*\* p<0.01 \*\*\*p<0.001

**Table S9a: ANOVA of rice genotypes under timely sown conditions**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Source of variation | df | Plant height(cm) | Grain yield per hill (g) | Grain yield/m2(g) |
| Treatments | 62 | 847.05\*\*\* | 22.14\*\*\* | 104668.62\*\*\* |
| Replication(block) | 1 | 0.71 | 0.18 | 880.07 |
| Error | 62 | 0.90 | 0.13 | 629.74 |
| Corrected total | 125 |  |  |  |
| CV |  | 1.07 | 6.68 | 6.68 |
| Root MSE |  | 0.95 | 0.36 | 25.09 |
| Mean |  | 88.93 | 5.46 | 375.53 |

**Table S9b: ANOVA of rice genotypes under late sown conditions**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Source of variation | df | Plant height(cm) | Grain yield per hill (g) | Grain yield/m2(g) |
| Treatments | 62 | 606.28\*\*\* | 6.14\*\*\* | 30098.29\*\*\* |
| Replication(block) | 1 | 82.60 | 1.18 | 5792.66 |
| Error | 62 | 4.29 | 0.30 | 1476.82 |
| Corrected total | 125 |  |  |  |
| CV |  | 2.97 | 18.88 | 18.88 |
| Root MSE |  | 2.07 | 0.54 | 38.42 |
| Mean |  | 69.70 | 2.90 | 203.51 |

**Table S10: Pearson correlation coefficient among different traits under organic irrigated, organic upland, conventional irrigated and conventional upland conditions**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | GY | DF | PH | PPMS |
| GY1 | 1 | 0.16 | -0.07 | 0.47\*\* |
| GY2 |  | -0.002 | 0.30\* | 0.60\*\* |
| GY3 |  | 0.45\*\* | -0.03 | 0.31\* |
| GY4 |  | -0.35\* | 0.20 | 0.42\* |
| DF1 |  | 1 | -0.17 | 0.14 |
| DF2 |  |  | -0.50\*\* | 0.27\* |
| DF3 |  |  | -0.11 | 0.12 |
| DF4 |  |  | 0.38\* | -0.11 |
| PH1 |  |  | 1 | 0.06 |
| PH2 |  |  |  | 0.47 |
| PH3 |  |  |  | 0.06 |
| PH4 |  |  |  | 0.06 |
| PPMS |  |  |  | 1 |

GY1,2,3,4: grain yield under organic irrigated1, organic upland2, conventional irrigated3 and conventional upland4

DF 1,2,3,4: days to flowering under organic irrigated1, organic upland2, conventional irrigated3 and conventional upland4

PH 1,2,3,4: plant height under organic irrigated1, organic upland2, conventional irrigated3 and conventional upland4

PPMS1,2,3,4,: panicles/m2 under organic irrigated1, organic upland2, conventional irrigated3 and conventional upland4