Table S1. List of genotypes and their respective origin

| **Entry** | **Name** | **Country origin** |  | **Entry** | **Name** | **Country origin** |
| --- | --- | --- | --- | --- | --- | --- |
| 1 | SOSAT C-88 | NIGER |  | 52 | IBL 100-5-1 | NIGER |
| 2 | 7042 S | NIGER |  | 53 | IBL 101-3-1 | NIGER |
| 3 | IBL 001-4-1 | UNKNOW |  | 54 | IBL 102-3-1 | NIGER |
| 4 | IBL 003-B-1 | UNKNOW |  | 55 | IBL 105-3-1 | NIGER |
| 5 | IBL 011-4-1 | UNKNOW |  | 56 | IBL 105-B-1 | NIGER |
| 6 | IBL 012-1-1 | UNKNOW |  | 57 | IBL 106-B-1 | NIGER |
| 7 | IBL 012-2-1 | UNKNOW |  | 58 | IBL 107-B-1 | NIGER |
| 8 | IBL 015-1-1 | UNKNOW |  | 59 | IBL 110-B-1 | NIGER |
| 9 | IBL 021-3-1 | UNKNOW |  | 60 | IBL 111-3-1 | NIGER |
| 10 | IBL 023-2-1 | UNKNOW |  | 61 | IBL 114-6-1 | NIGER |
| 11 | IBL 024-3-1 | UNKNOW |  | 62 | IBL 117-2-1 | NIGER |
| 12 | IBL 026-1-1 | UNKNOW |  | 63 | IBL 119-B-1 | SENEGAL |
| 13 | IBL 026-2-1 | UNKNOW |  | 64 | IBL 121-2-1 | SENEGAL |
| 14 | IBL 028-B-1 | UNKNOW |  | 65 | IBL 125-B-1 | BENIN |
| 15 | IBL 033-1-1 | UNKNOW |  | 66 | IBL 131-6-1 | MALI |
| 16 | IBL 037-4-1 | UNKNOW |  | 67 | IBL 133-2-1 | MALI |
| 17 | IBL 037-5-1 | UNKNOW |  | 68 | IBL 138-B-1 | MALI |
| 18 | IBL 040-1-1 | UNKNOW |  | 69 | IBL 141-B-1 | MALI |
| 19 | IBL 040-5-1 | UNKNOW |  | 70 | IBL 143-1-1 | MALI |
| 20 | IBL 047-1-1 | CAMEROUN |  | 71 | IBL 143-2-1 | MALI |
| 21 | IBL 050-1-1 | CENTRAFRIQUE |  | 72 | IBL 149-1-1 | MALI |
| 22 | IBL 053-2-1 | CENTRAFRIQUE |  | 73 | IBL 150-B-1 | MALI |
| 23 | IBL 053-3-1 | CENTRAFRIQUE |  | 74 | IBL 151-2-1 | MALI |
| 24 | IBL 055-4-1 | MALI |  | 75 | IBL 155-2-1 | MALI |
| 25 | IBL 056-2-1 | MALI |  | 76 | IBL 160-1-1 | BURKINA FASO |
| 26 | IBL 058-5-1 | MALI |  | 77 | IBL 161-1-1 | BURKINA FASO |
| 27 | IBL 061-1-1 | MALI |  | 78 | IBL 165-1-1 | BURKINA FASO |
| 28 | IBL 064-1-1 | MALI |  | 79 | IBL 167-5-1 | BURKINA FASO |
| 29 | IBL 065-B-1 | MALI |  | 80 | IBL 170-1-1 | BURKINA FASO |
| 30 | IBL 066-3-1 | MALI |  | 81 | IBL 170-B-1 | BURKINA FASO |
| 31 | IBL 066-4-1 | MALI |  | 82 | IBL 173-1-1 | BURKINA FASO |
| 32 | IBL 067-2-1 | NIGER |  | 83 | IBL 173-3-1 | BURKINA FASO |
| 33 | IBL 067-B-1 | NIGER |  | 84 | IBL 174-3-1 | BURKINA FASO |
| 34 | IBL 069-4-1 | NIGER |  | 85 | IBL 179-2-1 | BURKINA FASO |
| 35 | IBL 070-1-1 | NIGER |  | 86 | IBL 179-3-1 | BURKINA FASO |
| 36 | IBL 071-4-1 | NIGER |  | 87 | IBL 180-2-1 | MAURITANIE |
| 37 | IBL 073-B-1 | NIGER |  | 88 | IBL 181-2-1 | MAURITANIE |
| 38 | IBL 077-1-1 | BURKINA FASO |  | 89 | IBL 183-4-1 | MAURITANIE |
| 39 | IBL 079-B-1 | BURKINA FASO |  | 90 | IBL 183-5-1 | MAURITANIE |
| 40 | IBL 081-2-1 | BURKINA FASO |  | 91 | IBL 185-3-1 | MALI |
| 41 | IBL 082-B-1 | SENEGAL |  | 92 | IBL 186-1-1 | MALI |
| 42 | IBL 084-1-1 | SENEGAL |  | 93 | IBL 188-1-1 | MALI |
| 43 | IBL 091-1-1 | NIGER |  | 94 | IBL 198-1-1 | UNKNOW |
| 44 | IBL 092-3-1 | NIGER |  | 95 | IBL 198-2-1 | UNKNOW |
| 45 | IBL 093-1-1 | NIGER |  | 96 | IBL 200-3-1 | UNKNOW |
| 46 | IBL 094-2-1 | NIGER |  | 97 | IBL 206-1-1 | UNKNOW |
| 47 | IBL 095-1-1 | NIGER |  | 98 | SL 2-B-1 | SENEGAL |
| 48 | IBL 095-4-1 | NIGER |  | 99 | SL 4-3-1 | SENEGAL |
| 49 | IBL 098-1-1 | NIGER |  | 100 | SL 5-1-1 | SENEGAL |
| 50 | IBL 098-3-1 | NIGER |  | 101 | SL 5-4-1 | SENEGAL |
| 51 | IBL 099-3-1 | NIGER |  |  |  |  |

Table S2: Temperature and relative humidity of the two test sites from July to October 2016

|  |  |  |  |
| --- | --- | --- | --- |
| Site | Relative Humidity (%) |  | Temperature (oC)  |
| Min. | Max. | Mean |  | Min. | Max. | Mean |
| Bambey | 67.0 | 99.4 | 83.2 |  | 24.8 | 33.0 | 28.9 |
| Nioro | 67.5 | 97.1 | 82.3 |  | 24.0 | 33.0 | 28.5 |

Table S3: Performance of the 101 lines evaluated across Bambey and Nioro research stations during the rainy season 2016

| **Entry** | **DMI (%)** | **Severity (%)** | **Flowering (das)** | **Plant Height (cm)** | **Panicle length (cm)** | **Productive tillers** |
| --- | --- | --- | --- | --- | --- | --- |
| SOSAT C-88 | 7 | 6 | 46 | 210 | 26 | 3 |
| 7042 S | 86 | 85 | 45 | 159 | 14 | 1 |
| IBL 001-4-1 | 0 | 8 | 61 | 207 | 33 | 2 |
| IBL 003-B-1 | 4 | 2 | 48 | 223 | 29 | 2 |
| IBL 011-4-1 | 4 | 1 | 46 | 231 | 35 | 3 |
| IBL 012-1-1 | 54 | 14 | 62 | 159 | 25 | 1 |
| IBL 012-2-1 | 63 | 13 | 64 | 155 | 36 | 2 |
| IBL 015-1-1 | 3 | 5 | 53 | 199 | 42 | 3 |
| IBL 021-3-1 | 4 | 3 | 63 | 256 | 38 | 1 |
| IBL 023-2-1 | 25 | 44 | 63 | 187 | 25 | 1 |
| IBL 024-3-1 | 92 | 27 | 59 | 193 | 34 | 2 |
| IBL 026-1-1 | 38 | 10 | 60 | 210 | 39 | 2 |
| IBL 026-2-1 | 16 | 4 | 55 | 188 | 56 | 1 |
| IBL 028-B-1 | 25 | 28 | 62 | 162 | 39 | 2 |
| IBL 033-1-1 | 12 | 4 | 57 | 163 | 31 | 1 |
| IBL 037-4-1 | 5 | 60 | 44 | 223 | 24 | 2 |
| IBL 037-5-1 | 13 | 24 | 48 | 66 | 15 | 0 |
| IBL 040-1-1 | 9 | 15 | 45 | 237 | 37 | 4 |
| IBL 040-5-1 | 0 | 3 | 46 | 168 | 22 | 1 |
| IBL 047-1-1 | 5 | 9 | 61 | 171 | 22 | 3 |
| IBL 050-1-1 | 7 | 5 | 59 | 214 | 30 | 2 |
| IBL 053-2-1 | 4 | 0 | 62 | 269 | 32 | 1 |
| IBL 053-3-1 | 38 | 2 | 61 | 235 | 32 | 1 |
| IBL 055-4-1 | 0 | 0 | 50 | 207 | 36 | 1 |
| IBL 056-2-1 | 5 | 11 | 48 | 157 | 20 | 1 |
| IBL 058-5-1 | 8 | 5 | 47 | 169 | 23 | 2 |
| IBL 061-1-1 | 39 | 8 | 68 | 229 | 30 | 2 |
| IBL 064-1-1 | 86 | 59 | 68 | 161 | 22 | 1 |
| IBL 065-B-1 | 0 | 3 | 70 | 183 | 27 | 4 |
| IBL 066-3-1 | 4 | 12 | 46 | 115 | 17 | 1 |
| IBL 066-4-1 | 33 | 9 | 46 | 117 | 24 | 2 |
| IBL 067-2-1 | 29 | 2 | 47 | 183 | 32 | 2 |
| IBL 067-B-1 | 14 | 4 | 47 | 178 | 33 | 2 |
| IBL 069-4-1 | 79 | 3 | 57 | 180 | 35 | 2 |
| IBL 070-1-1 | 33 | 15 | 45 | 154 | 38 | 1 |
| IBL 071-4-1 | 8 | 3 | 63 | 177 | 21 | 4 |
| IBL 073-B-1 | 29 | 5 | 50 | 233 | 38 | 2 |
| IBL 077-1-1 | 12 | 3 | 53 | 231 | 30 | 3 |
| IBL 079-B-1 | 20 | 3 | 50 | 145 | 22 | 3 |
| IBL 081-2-1 | 23 | 6 | 61 | 206 | 24 | 2 |
| IBL 082-B-1 | 22 | 4 | 58 | 180 | 31 | 2 |
| IBL 084-1-1 | 0 | 1 | 49 | 183 | 25 | 2 |
| IBL 091-1-1 | 4 | 2 | 60 | 226 | 36 | 1 |
| IBL 092-3-1 | 10 | 4 | 56 | 252 | 38 | 2 |
| IBL 093-1-1 | 12 | 5 | 49 | 211 | 26 | 2 |
| IBL 094-2-1 | 15 | 2 | 53 | 262 | 33 | 2 |
| IBL 095-1-1 | 33 | 25 | 58 | 152 | 39 | 1 |
| IBL 095-4-1 | 0 | 0 | 44 | 231 | 47 | 2 |
| IBL 098-1-1 | 0 | 0 | 58 | 186 | 30 | 4 |
| IBL 098-3-1 | 4 | 1 | 53 | 239 | 43 | 2 |
| IBL 099-3-1 | 7 | 5 | 46 | 165 | 31 | 2 |
| IBL 100-5-1 | 13 | 3 | 55 | 247 | 35 | 3 |
| IBL 101-3-1 | 4 | 1 | 57 | 190 | 24 | 2 |
| IBL 102-3-1 | 6 | 2 | 51 | 184 | 27 | 3 |
| IBL 105-3-1 | 13 | 4 | 61 | 164 | 38 | 2 |
| IBL 105-B-1 | 27 | 2 | 55 | 166 | 31 | 2 |
| IBL 106-B-1 | 0 | 0 | 55 | 258 | 46 | 2 |
| IBL 107-B-1 | 31 | 16 | 71 | 196 | 35 | 1 |
| IBL 110-B-1 | 3 | 2 | 49 | 223 | 37 | 2 |
| IBL 111-3-1 | 0 | 0 | 49 | 161 | 24 | 3 |
| IBL 114-6-1 | 0 | 1 | 70 | 210 | 30 | 1 |
| IBL 117-2-1 | 31 | 9 | 63 | 202 | 20 | 1 |
| IBL 119-B-1 | 8 | 0 | 60 | 267 | 43 | 2 |
| IBL 121-2-1 | 78 | 81 | 72 | 63 | 10 | 1 |
| IBL 125-B-1 | 26 | 5 | 55 | 169 | 30 | 2 |
| IBL 131-6-1 | 4 | 9 | 46 | 163 | 23 | 3 |
| IBL 133-2-1 | 0 | 2 | 75 | 196 | 33 | 2 |
| IBL 138-B-1 | 65 | 56 | 67 | 172 | 25 | 1 |
| IBL 141-B-1 | 0 | 5 | 48 | 194 | 21 | 2 |
| IBL 143-1-1 | 0 | 5 | 45 | 171 | 22 | 3 |
| IBL 143-2-1 | 0 | 1 | 47 | 187 | 22 | 3 |
| IBL 149-1-1 | 1 | 7 | 54 | 134 | 26 | 3 |
| IBL 150-B-1 | 4 | 1 | 70 | 178 | 29 | 1 |
| IBL 151-2-1 | 4 | 3 | 45 | 176 | 36 | 3 |
| IBL 155-2-1 | 8 | 14 | 46 | 205 | 30 | 2 |
| IBL 160-1-1 | 0 | 0 | 68 | 176 | 25 | 2 |
| IBL 161-1-1 | 0 | 0 | 66 | 212 | 17 | 2 |
| IBL 165-1-1 | 7 | 2 | 52 | 253 | 43 | 3 |
| IBL 167-5-1 | 14 | 1 | 47 | 200 | 33 | 3 |
| IBL 170-1-1 | 11 | 32 | 66 | 204 | 21 | 1 |
| IBL 170-B-1 | 26 | 13 | 47 | 159 | 28 | 1 |
| IBL 173-1-1 | 14 | 3 | 72 | 178 | 39 | 1 |
| IBL 173-3-1 | 5 | 0 | 50 | 186 | 33 | 2 |
| IBL 174-3-1 | 63 | 53 | 74 | 58 | 13 | 0 |
| IBL 179-2-1 | 0 | 1 | 54 | 209 | 26 | 2 |
| IBL 179-3-1 | 4 | 1 | 47 | 232 | 23 | 2 |
| IBL 180-2-1 | 19 | 8 | 49 | 190 | 23 | 2 |
| IBL 181-2-1 | 5 | 12 | 48 | 167 | 33 | 2 |
| IBL 183-4-1 | 0 | 6 | 49 | 181 | 27 | 3 |
| IBL 183-5-1 | 36 | 10 | 49 | 145 | 25 | 1 |
| IBL 185-3-1 | 10 | 4 | 51 | 173 | 30 | 2 |
| IBL 186-1-1 | 0 | 0 | 49 | 224 | 26 | 3 |
| IBL 188-1-1 | 0 | 1 | 49 | 153 | 38 | 2 |
| IBL 198-1-1 | 24 | 9 | 53 | 148 | 28 | 1 |
| IBL 198-2-1 | 16 | 2 | 46 | 218 | 28 | 2 |
| IBL 200-3-1 | 4 | 18 | 50 | 182 | 32 | 2 |
| IBL 206-1-1 | 8 | 4 | 52 | 205 | 27 | 1 |
| SL 2-B-1 | 25 | 4 | 72 | 138 | 26 | 3 |
| SL 4-3-1 | 95 | 26 | 63 | 192 | 43 | 1 |
| SL 5-1-1 | 4 | 6 | 60 | 166 | 19 | 1 |
| SL 5-4-1 | 11 | 5 | 47 | 190 | 40 | 2 |
| Mean | 17 | 10 | 55 | 188 | 30 | 2 |
| Minimum | 0 | 0 | 44 | 57 | 10 | 0 |
| Maximum | 95 | 85 | 75 | 269 | 56 | 4 |
| SD | 22.7 | 16.3 | 8.5 | 39.7 | 8.1 | 0.8 |

Table S4: Lambda Wilk test from the six variables

|  |  |  |  |
| --- | --- | --- | --- |
| Variable | Lambda | F | p-value |
| DMI | 0.3260 | 101.2922 | < 0,0001 |
| Severity | 0.5101 | 47.0538 | < 0,0001 |
| Flowering | 0.9118 | 4.7394 | 0.0108 |
| Plant Height | 0.4221 | 67.0929 | < 0,0001 |
| Panicle length | 0.9324 | 3.5506 | 0.0325 |
| Productive tillers | 0.9129 | 4.6733 | 0.0115 |