**Table S1. Passport data of the maize landraces collected from different states of North East Hill Region (NEHR) of India used in the current study**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **S. No** | **Code** | **Place of collection** | **District** | **State** | **Altitude**  **(MetersAbove Sea Level)** |
| 1 | M22 | MOOTYRSHIAH | JAINTIA HILLS | MEGHALAYA | 1380 |
| 2 | Ma5 | KAKCHING | KAKCHING | MANIPUR | 776 |
| 3 | N21 | WOKHA | WOKHA | NAGALAND | 1313 |
| 4 | N25 | PHEK | PHEK | NAGALAND | 1524 |
| 5 | S16 | WEST SIKKIM | WEST SIKKIM | SIKKIM | 1700 |
| 6 | M9 | UPPER SHILLONG | EAST KHASI HILLS | MEGHALAYA | 1520 |
| 7 | T9 | SOUTH TRIPURA (KD) | SOUTH TRIPURA | TRIPURA | 26 |

**Table S2. SSR primers used in the current study along with their chromosomal bin number and annealing temperature (°C )**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **S. No** | **Primer** | **Bin** | **Forward chain** | **Reverse chain** | **Annealing temperature (0C)** |
| **1** | *umc1222* | 1.01 | CTCAGAACAGAAGCCATCAAAAGC | CGTCTTCGTGAGAGACATCCTGT | 66 |
| **2** | *bnlg1614* | 1.02 | CCAACCCACCCAGAGGAGA | AGCGGGCGAGATCTTCAT | 58 |
| **3** | *phi109275* | 1.03 | CGGTTCATGCTAGCTCTGC | GTTGTGGCTGTGGTGGTG | 64 |
| **4** | *bnlg439* | 1.03 | TTGACATCGCCATCTTGGTGACCA | TCTTAATGCGATCGTACGAAGTTGTGGAA | 72 |
| **5** | *bnlg1484* | 1.03 | GTAAAAGACGACGACATTCG | GCTTCTGACGTGCACTCCGTTTAACA | 59 |
| **6** | *phi339017* | 1.03 | ACTGCTGTTGGGGTAGGG | GCAGCTTGAGCAGGAAGC | 62 |
| **7** | *umc1335* | 1.06 | ATGGCATGCATGTGTTTGTTTTAC | ACAGACGTCGCTAATTCCTGAAAG | 58 |
| **8** | *bnlg381* | 2.04 | TCCCTCTTGAGTGTTTATCACAAA | GTTTCCATGGGCAGGTGTAT | 64 |
| **9** | *phi127* | 2.08 | ATATGCATTGCCTGGAACTGGAAGGA | AATTCAAACACGCCTCCCGAGTGT | 72 |
| **10** | *phi101049* | 2.09 | CCGGGAACTTGTTCATCG | CCACGTCCATGATCACACC | 64 |
| **11** | *umc1551* | 2.09 | CACCGGAACACCTTCTTACAGTTT | CGAAACCTTCTCGTGATGAGC | 66 |
| **12** | *bnlg1520* | 2.09 | TCCTCTTGCTCTCCATGTCC | GCTTCTACAGCTGCGTAGCTTCTTCC | 64 |
| **13** | *umc2101* | 3.00 | CCCGGCTAGAGCTATAAAGCAAGT | CTAGCTAGTTTGGTGCGTGGTGAT | 66 |
| **14** | *bnlg1523* | 3.03 | GAGCACAGCTAGGCAAAGG | GCTTCTCTCGCACGCTCTCTCTTTCTTT | 62 |
| **15** | *phi029* | 3.04 | TTGTCTTTCTTCCTCCACAAGCAGCGAA | ATTTCCAGTTGCCACCGACGAAGAACTT | 55 |
| **16** | *phi053* | 3.05 | CTGCCTCTCAGATTCAGAGATTGAC | AACCCAACGTACTCCGGCAG | 64 |
| **17** | *phi073* | 3.05 | GTGCGAGAGGCTTGACCAA | GCTTCTAAGGGTTGAGGGCGAGGAA | 66 |
| **18** | *bnlg197* | 3.06 | GCGAGAAGAAAGCGAGCAGA | CGCCAAGAAGAAACACATCACA | 67 |
| **19** | *phi072* | 4.01 | ACCGTGCATGATTAATTTCTCCAGCCTT | GACAGCGCGCAAATGGATTGAACT | 72 |
| **20** | *bnlg2162* | 4.08 | GTCTGCTGCTAGTGGTGGTG | CACCGGCATTCGATATCTTT | 64 |
| **21** | *umc1705* | 5.03 | ATGCGTCTTTCACAAAGCATTACA | AGGTGCAGTTCATAGACTTCCTGG | 66 |
| **22** | *phi085* | 5.06 | AGCAGAACGGCAAGGGCTAT | GCTTCTTTTGGCACACCACGACGA | 67 |
| **23** | *umc1153* | 5.09 | [CAGCATCTATAGCTTGCTTGCATT](http://www.maizegdb.org/data_center/primer?id=235184) | [TGGGTTTTGTTTGTTTGTTTGTTG](http://www.maizegdb.org/data_center/primer?id=235185) | 65 |
| **24** | *phi126* | 6.00 | TCCTGCTTATTGCTTTCGTCAT | GAGCTTGCATATTTCTTGTGGACA | 64 |
| **25** | *phi423796* | 6.02 | CACTACTCGATCTGAACCACCA | CGCTCTGTGAATTTGCTAGCTC | 54 |
| **26** | *mmc0241* | 6.05 | TATATCCGTGCATTTACGTTT | CATCGCTTGTCTGTCGA | 58 |
| **27** | *phi299852* | 6.07 | [GATGTGGGTGCTACGAGCC](http://www.maizegdb.org/data_center/primer?id=256136) | [AGATCTCGGAGCTCGGCTA](http://www.maizegdb.org/data_center/primer?id=256137) | 64 |
| **28** | *umc2059* | 6.08 | GGAAAAGGAGGAACAGTGTAAGCA | AGCGTGATCAGACGTACAATGCTA | 66 |
| **29** | *phi112* | 7.01 | TGCCCTGCAGGTTCACATTGAGT | AGGAGTACGCTTGGATGCTCTTC | 68 |
| **30** | *phi034* | 7.02 | TAGCGACAGGATGGCCTCTTCT | GGGGAGCACGCCTTCGTTCT | 54 |
| **31** | *phi328175* | 7.04 | GGGAAGTGCTCCTTGCAG | CGGTAGGTGAACGCGGTA | 56 |
| **32** | *bnlg2181* | 8.00 | CCAATTCACCAATCATGCAA | TTGGGGTGAAGCAATGTGTA | 63 |
| **33** | *umc1327* | 8.01 | AGGGTTTTGCTCTTGGAATCTCTC | GAGGAAGGAGGAGGTCGTATCGT | 66 |
| **34** | *bnlg1194* | 8.02 | GCGTTATTAAGGCAAGCTGC | GCTTCTACGTGAAGCAGAGGATCCAT | 60 |
| **35** | *phi233376* | 8.03 | [TATCTGACGAATCCCATTCCC](http://www.maizegdb.org/data_center/primer?id=256085) | GTACGTAACGGACGGACGG | 65 |
| **36** | *umc1149* | 8.06 | TACAGTAGGGATTCTTGCAGCCTC | [GTGGGACCTTGTTGCTTCCTTT](https://www.maizegdb.org/data_center/primer?id=235173) | 60 |
| **37** | *umc1997* | 8.06 | [GTTCCAATGAGATGAGACGATGTG](https://www.maizegdb.org/data_center/primer?id=302032) | [CTCCAAAAAGGCCGTCGTAGTA](https://www.maizegdb.org/data_center/primer?id=302033) | 58 |
| **39** | *phi100175* | 8.06 | TATCTGACGAATCCCATTCCC | GTACGTAACGGACGGACGG | 64 |
| **39** | *bmc1152* | 8.06 | [CGCTACCGATTGTTGAATTG](https://www.maizegdb.org/data_center/primer?id=171140) | [AAAGTCGTCCGGTCAAATTG](https://www.maizegdb.org/data_center/primer?id=171141) | 63 |
| **40** | *phi080* | 8.08 | CACCCGATGCAACTTGCGTAGA | TCGTCACGTTCCACGACATCAC | 62 |
| **41** | *phi061* | 9.03 | GACGTAAGCCTAGCTCTGCAT | GCTTCTAAACAAGAACGGCGGTGCTGA | 62 |
| **42** | *bnlg244* | 9.02 | GATGCTACTACTGGTCTAGTCCAGA | CTCCTCCACTCATCAGCCTTGA | 66 |
| **43** | *umc1277* | 9.08 | TTTGAGAACGGAAGCAAGTACTCC | ACCAACCAACCACTCCCTTTTTAG | 60 |
| **45** | *umc1380* | 10.00 | CTGCTGATGTCTGGAAGAACCCT | AGCATCATGCCAGCAGGTTTT | 67 |
| **46** | *phi059* | 10.02 | AAGCTAATTAAGGCCGGTCATCCC | TCCGTGTACTCGGCGGACTC | 65 |
| **47** | *bnlg2336* | 10.04 | [GGTAGGGGAAAAAACATGCA](http://www.maizegdb.org/data_center/primer?id=171650) | [TGATAAAGTTCTCTATTTGTCTGCC](http://www.maizegdb.org/data_center/primer?id=171651) | 61 |
| **48** | *umc1196* | 10.07 | CGTGCTACTACTGCTACAAAGCGA | AGTCGTTCGTGTCTTCCGAAACT | 66 |

**Table S3. Genetic parameters with respect to the 38 SSR markers used in the current study**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **S. No.** | **SSR marker** | **Bin No** | **PIC** | **%Het** | **Fis** | **Fit** | **Fst** | **Nm** | **Gst** | **G''st** | **Fixation Index** | **Total No. Alleles** |
|  | *umc1222* | 1.01 | 0.47 | 20.2 | 0.28 | 0.30 | 0.03 | 8.67 | 0.01 | 0.04 | 0.31 | 2 |
|  | *bnlg1614* | 1.02 | 0.39 | 6.0 | 0.68 | 0.71 | 0.07 | 3.21 | 0.05 | 0.11 | 0.50 | 2 |
|  | *bnlg439* | 1.03 | 0.51 | 5.4 | 0.83 | 0.83 | 0.05 | 5.11 | 0.03 | 0.08 | 0.82 | 3 |
|  | *bnlg1484* | 1.03 | 0.50 | 19.3 | 0.44 | 0.44 | 0.00 | 55.46 | -0.01 | -0.04 | 0.44 | 2 |
|  | *umc1335* | 1.06 | 0.38 | 6.5 | 0.85 | 0.87 | 0.16 | 1.28 | 0.14 | 0.31 | 0.74 | 2 |
|  | *bnlg381* | 2.04 | 0.42 | 14.4 | 0.45 | 0.59 | 0.26 | 0.72 | 0.24 | 0.51 | 0.32 | 2 |
|  | *phi127* | 2.08 | 0.16 | 0.0 | 1.00 | 1.00 | 0.21 | 0.94 | 0.19 | 0.32 | 1.00 | 2 |
|  | *phi10104* | 2.09 | 0.41 | 8.3 | 0.38 | 0.75 | 0.59 | 0.17 | 0.58 | 0.84 | 0.34 | 3 |
|  | *umc1551* | 2.09 | 0.46 | 6.7 | 0.76 | 0.76 | 0.01 | 16.81 | 0.00 | -0.01 | 0.74 | 2 |
|  | *bnlg1520* | 2.09 | 0.48 | 6.0 | 0.78 | 0.82 | 0.21 | 0.97 | 0.19 | 0.40 | 0.58 | 2 |
|  | *umc2101* | 3 | 0.40 | 23.8 | -0.41 | -0.10 | 0.22 | 0.86 | 0.22 | 0.43 | -0.16 | 2 |
|  | *bnlg1523* | 3.03 | 0.12 | 0.0 | 1.00 | 1.00 | 0.01 | 33.12 | -0.02 | -0.03 | 1.00 | 2 |
|  | *phi029* | 3.04 | 0.44 | 21.6 | 0.34 | 0.36 | 0.03 | 7.22 | 0.02 | 0.05 | 0.30 | 3 |
|  | *phi053* | 3.05 | 0.07 | 0.0 | 1.00 | 1.00 | 0.04 | 5.44 | 0.02 | 0.03 | 1.00 | 2 |
|  | *bnlg197* | 3.06 | 0.36 | 6.2 | 0.75 | 0.75 | 0.01 | 29.06 | -0.01 | -0.03 | 0.77 | 2 |
|  | *phi072* | 4.01 | 0.34 | 3.6 | 0.96 | 0.97 | 0.27 | 0.68 | 0.25 | 0.49 | 0.98 | 3 |
|  | *bnlg2162* | 4.08 | 0.19 | 9.9 | 0.04 | 0.07 | 0.03 | 7.94 | 0.02 | 0.03 | 0.02 | 3 |
|  | *umc1705* | 5.03 | 0.24 | 0.9 | 0.94 | 0.96 | 0.32 | 0.53 | 0.30 | 0.51 | 0.96 | 2 |
|  | *phi085* | 5.06 | 0.18 | 9.0 | 0.07 | 0.09 | 0.02 | 11.99 | 0.01 | 0.01 | 0.02 | 3 |
|  | *umc1153* | 5.09 | 0.45 | 8.8 | 0.78 | 0.82 | 0.21 | 0.97 | 0.19 | 0.42 | 0.78 | 3 |
|  | *phi126* | 6 | 0.45 | 5.3 | 0.80 | 0.81 | 0.08 | 2.87 | 0.06 | 0.14 | 0.62 | 2 |
|  | *phi423796* | 6.01 | 0.48 | 15.4 | 0.52 | 0.59 | 0.16 | 1.33 | 0.14 | 0.35 | 0.52 | 2 |
|  | *mmc0241* | 6.05 | 0.38 | 17.8 | 0.04 | 0.21 | 0.18 | 1.12 | 0.17 | 0.36 | 0.31 | 2 |
|  | *phi299852* | 6.07 | 0.42 | 6.7 | 0.77 | 0.78 | 0.06 | 4.00 | 0.04 | 0.10 | 0.80 | 2 |
|  | *umc2059* | 6.08 | 0.52 | 29.1 | 0.44 | 0.45 | 0.01 | 39.54 | -0.01 | -0.03 | 0.46 | 3 |
|  | *phi034* | 7.02 | 0.49 | 9.0 | 0.61 | 0.75 | 0.35 | 0.47 | 0.33 | 0.65 | 0.47 | 2 |
|  | *umc1327* | 8.01 | 0.12 | 3.5 | 0.50 | 0.57 | 0.14 | 1.50 | 0.13 | 0.20 | 0.50 | 2 |
|  | *phi233376* | 8.03 | 0.35 | 7.4 | 0.65 | 0.70 | 0.15 | 1.44 | 0.13 | 0.27 | 0.72 | 2 |
|  | *umc1149* | 8.06 | 0.50 | 8.3 | 0.73 | 0.75 | 0.06 | 3.81 | 0.04 | 0.11 | 0.68 | 4 |
|  | *umc1997* | 8.06 | 0.49 | 22.7 | 0.31 | 0.32 | 0.01 | 16.56 | 0.00 | 0.00 | 0.31 | 2 |
|  | *phi100175* | 8.06 | 0.45 | 20.3 | 0.57 | 0.58 | 0.01 | 17.50 | 0.00 | -0.01 | 0.61 | 2 |
|  | *bmc1152* | 8.06 | 0.30 | 1.8 | 0.87 | 0.88 | 0.06 | 3.60 | 0.04 | 0.09 | 0.87 | 2 |

**Table S3 (cntd.)**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **S. No.** | **SSR marker** | **Bin No** | **PIC** | **%Het** | **Fis** | **Fit** | **Fst** | **Nm** | **Gst** | **G''st** | **Fixation Index** | **Total No. Alleles** |
|  | *phi080* | 8.08 | 0.42 | 3.7 | 0.92 | 0.93 | 0.03 | 9.22 | 0.00 | 0.01 | 0.92 | 2 |
|  | *phi061* | 9.03 | 0.27 | 4.4 | 0.73 | 0.78 | 0.19 | 1.05 | 0.18 | 0.33 | 0.78 | 2 |
|  | *umc1277* | 9.08 | 0.57 | 10.7 | 0.54 | 0.60 | 0.14 | 1.58 | 0.12 | 0.34 | 0.59 | 3 |
|  | *phi041* | 10 | 0.48 | 21.2 | 0.44 | 0.45 | 0.03 | 9.74 | 0.01 | 0.02 | 0.44 | 2 |
|  | *phi059* | 10.02 | 0.49 | 22.9 | 0.23 | 0.24 | 0.02 | 15.93 | 0.00 | 0.01 | 0.24 | 3 |
|  | *bnlg2336* | 10.04 | 0.35 | 0.0 | 1.00 | 1.00 | 0.55 | 0.21 | 0.53 | 0.80 | 1.00 | 2 |
|  |  | **Mean** | **0.38** | **10.18** | **0.59** | **0.64** | **0.13** | **8.49** | **0.11** | **0.22** | **0.59** | **2.32** |

**PIC: Polymorphic information content; %Het: Percent heterozygosity; Fis- Consaguinity coefficient; Fst- Co-ancestry coefficient; Fit-Inbreeding coefficient; Nm: Number of effective migrants; GST-Hedrick standardized for small populations; F- Fixation Index**

**Table S4. Percent heterozygosity in the individual lines studied following six generations of inbreeding**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **% Heterozygosity** | | | | | | | | | | | | | | | |
| **Population I** | |  |  |  |  | **Population II** | |  |  | **Population III** | |  |  |  |  |
| **Line** | **M22** | **Ma5** | **N11** | **N25** | **S16** | **Line** | **M9** | **Line** | **T9** | **Line** | **M22** | **M9** | **Ma5** | **N11** | **T9** |
|  |  |  |  |  |  |  | **Pop-M9** |  | **Pop-T9** |  |  |  |  |  |  |
| G10 |  |  | 16.3 |  |  | G33 | 0.0 | G66 | 10.5 | G1 | 30.2 |  |  |  |  |
| G11 |  |  | 14.3 |  |  | G34 | 4.8 | G67 | 10.0 | G110 |  |  |  |  | 10.8 |
| G12 |  |  | 23.3 |  |  | G36 | 11.9 | G68 | 8.1 | G111 |  |  |  |  | 15.0 |
| G14 |  |  |  | 18.6 |  | G38 | 9.3 | G69 | 10.3 | G13 |  |  |  | 16.3 |  |
| G15 |  |  |  | 21.4 |  | G39 | 14.6 | G70 | 5.1 | G2 | 16.7 |  |  |  |  |
| G16 |  |  |  |  | 23.3 | G41 | 7.3 | G71 | 10.0 | G35 |  |  |  | 14.6 |  |
| G17 |  |  |  |  | 20.9 | G44 | 9.3 | G74 | 14.3 | G37 |  | 7.3 |  |  |  |
| G18 |  |  |  |  | 14.0 | G46 | 7.0 | G75 | 9.5 | G4 | 11.6 |  |  |  |  |
| G19 |  |  |  |  | 16.3 | G47 | 10.0 | G76 | 4.8 | G40 |  | 11.6 |  |  |  |
| G20 |  |  |  |  | 16.3 | G48 | 2.5 | G77 | 9.5 | G42 |  | 11.6 |  |  |  |
| G21 |  |  |  |  | 23.3 | G49 | 4.7 | G78 | 7.1 | G43 |  | 9.3 |  |  |  |
| G22 |  |  |  |  | 18.6 | G53 | 7.3 | G79 | 2.6 | G45 |  | 22.0 |  |  |  |
| G23 |  |  |  |  | 23.8 | G55 | 12.5 | G80 | 15.4 | G50 |  | 24.3 |  |  |  |
| G24 |  |  |  |  | 16.7 | G56 | 7.7 | G81 | 7.3 | G51 |  | 14.6 |  |  |  |
| G25 |  |  |  |  | 25.0 | G57 | 4.9 | G82 | 2.4 | G52 |  | 2.4 |  |  |  |
| G26 |  |  |  |  | 14.0 | G58 | 11.9 | G83 | 0.0 | G54 |  | 9.5 |  |  |  |
| G27 |  |  |  |  | 7.1 | G59 | 17.9 | G84 | 7.1 | G60 |  | 17.5 |  |  |  |
| G28 |  |  |  |  | 19.0 | G61 | 2.5 | G85 | 10.0 | G62 |  | 14.6 |  |  |  |
| G29 |  |  |  |  | 14.0 | G63 | 7.5 | G86 | 11.9 | G7 |  |  | 11.6 |  |  |
| G3 | 11.9 |  |  |  |  | G64 | 17.1 | G87 | 14.3 | G72 |  |  |  |  | 17.5 |
| G30 |  |  |  |  | 20.9 | G65 | 15.0 | G88 | 2.4 | G73 |  |  |  |  | 14.6 |
| G31 |  |  |  |  | 21.4 |  |  | G90 | 19.5 | G8 |  |  | 7.0 |  |  |
| G32 |  |  |  |  | 18.6 |  |  | G91 | 12.2 | G89 |  |  |  |  | 14.0 |
| G5 |  | 25.6 |  |  |  |  |  | G92 | 7.3 |  |  |  |  |  |  |
| G6 |  | 18.6 |  |  |  |  |  | G93 | 12.2 |  |  |  |  |  |  |
| G9 |  | 11.6 |  |  |  |  |  | G94 | 9.3 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | G95 | 2.5 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | G96 | 5.3 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | G97 | 14.6 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | G98 | 11.9 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | G99 | 4.7 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | G100 | 13.2 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | G101 | 8.3 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | G102 | 5.0 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | G103 | 7.9 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | G104 | 10.3 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | G105 | 12.8 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | G106 | 17.5 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | G107 | 10.0 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | G108 | 10.0 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | G109 | 5.1 |  |  |  |  |  |  |

Ma5: MANIPUR M9: MEGHALAYA M22: MEGHALAYA N21: NAGALAND N25: NAGALAND S16: SIKKIM T9: TRIPURA

**Table S5. Descriptive statistics, squared cosines values of factor loadings derived and their correlation for yield related traits studied**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Descriptive statistics** | | | **Squared cosines values of factor loadings** | | | **Correlations values** | | |
| **Variable** | Range | Mean | CV | PC1 | PC2 | PC3 | PC1 | PC2 | PC3 |
| **ASI** | 9.0 | 3.2 | 59.8 | 0.00 | 0.01 | 0.98 | 0.02 | -0.10 | -0.99 |
| **PH** | 150.0 | 141.9 | 22.0 | 0.13 | 0.71 | 0.01 | 0.36 | 0.84 | -0.08 |
| **EH** | 139.7 | 64.2 | 45.5 | 0.12 | 0.76 | 0.00 | 0.35 | 0.87 | 0.04 |
| **EWH** | 170.0 | 100.1 | 34.8 | 0.86 | 0.00 | 0.01 | 0.93 | -0.04 | -0.09 |
| **EWWH** | 140.0 | 84.1 | 38.1 | 0.92 | 0.00 | 0.00 | 0.96 | -0.05 | -0.04 |
| **EL** | 15.4 | 8.9 | 36.0 | 0.35 | 0.13 | 0.01 | 0.59 | -0.37 | 0.09 |
| **NK** | 34.0 | 17.1 | 45.1 | 0.46 | 0.14 | 0.01 | 0.68 | -0.38 | 0.10 |
| **GYP** | 101.2 | 42.4 | 57.0 | 0.86 | 0.00 | 0.00 | 0.92 | -0.05 | 0.03 |

**CV: Co efficient of Variation (%)**

**ASI: Anthesis to silking interval (days); PH: Plant height (cm); EH: Ear height (cm); EWH: Ear weight with husk (g); EWWH: Ear weight without husk (g); EL: Ear length (cm); NK: Number of kernels per row; GYP: Grain yield per plant (g)**

**Table S6. Commercial Heterosis over three checks (DMH-121, CMH08-292 and BIO9544) in inter population crosses generated for ear related traits from a partial diallel experiment over two sowing windows - Rabi 2018 and Kharif 2019 respectively**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | Rabi 2018 (First Sowing Window) | | | | | | | | Kharif 2019 (Second Sowing Window) | | | | | | | | | |
|  | | EWH | EWWH | | EL | | NK | GYP | | EWH | | EWWH | | EL | | NK | | GYP | |
| **Population III x Population I** | | | | | | | | | | | | | |  | |  | |  | |
| H17 |  | |  |  | |  | | |  | |  | |  | |  | |  | |  |
| H18 |  | |  |  | |  | | |  | |  | |  | |  | |  | |  |
| H19 |  | |  |  | |  | | |  | |  | |  | |  | |  | |  |
| H20 |  | |  | |  | |  |  | |  | |  | |  | |  | |  | |
| H21 |  | |  | |  | |  |  | |  | |  | |  | |  | |  | |
| H3 |  | |  | |  | |  |  | |  | |  | |  | |  | |  | |
| H4 |  | |  | |  | |  |  | |  | |  | |  | |  | |  | |
| H5 |  | |  | |  | |  |  | |  | |  | |  | |  | |  | |
| H6 |  | |  | |  | |  |  | |  | |  | |  | |  | |  | |
| H7 |  | |  | |  | |  |  | |  | |  | |  | |  | |  | |
| **Population III x Population II** | | | | | | | | | | | | | |  | |  | |  | |
| H1 |  | |  | |  | |  |  | |  | |  | |  | |  | |  | |
| H22 |  | |  | |  | |  |  | |  | |  | |  | |  | |  | |
| H8 |  | |  | |  | |  |  | |  | |  | |  | |  | |  | |
| **Population II x Population I** | | | | | | | | | | | |  | |  | |  | |  | |
| H11 |  | |  | |  | |  |  | |  | |  | |  | |  | |  | |
| H12 |  | |  | |  | |  |  | |  | |  | |  | |  | |  | |
| H13 |  | |  | |  | |  |  | |  | |  | |  | |  | |  | |
| H14 |  | |  | |  | |  |  | |  | |  | |  | |  | |  | |
| H15 |  | |  | |  | |  |  | |  | |  | |  | |  | |  | |
| **Population II x Population III** | | | | | | | | | | | |  | |  | |  | |  | |
| H10 |  | |  | |  | |  |  | |  | |  | |  | |  | |  | |
| H41 |  | |  | |  | |  |  | |  | |  | |  | |  | |  | |
| **Population I x Population II** | | | | | | | | | | | |  | |  | |  | |  | |
| H28 |  | |  | |  | |  |  | |  | |  | |  | |  | |  | |
| H33 |  | |  | |  | |  |  | |  | |  | |  | |  | |  | |
| H37 |  | |  | |  | |  |  | |  | |  | |  | |  | |  | |
| H39 |  | |  | |  | |  |  | |  | |  | |  | |  | |  | |
| **Population I x Population III** | | | | | | | | | | | |  | |  | |  | |  | |
| H29 |  | |  | |  | |  |  | |  | |  | |  | |  | |  | |
| H34 |  | |  | |  | |  |  | |  | |  | |  | |  | |  | |
| H35 |  | |  | |  | |  |  | |  | |  | |  | |  | |  | |
| H38 |  | |  | |  | |  |  | |  | |  | |  | |  | |  | |
| H40 |  | |  | |  | |  |  | |  | |  | |  | |  | |  | |
|  | | | | | | | | | | EWH: Ear weight with husk (g) | | | | | | | | | |
|  | Superiority over a single commercial check | | | | | | | | | EWWH: Ear weight without husk (g) | | | | | | | | | |
|  | Superiority over two commercial checks | | | | | | | | | EL: Ear length (cm) | | | | | | | | | |
|  | Superiority over all three commercial checks | | | | | | | | | NK: Number of kernels per row | | | | | | | | | |
|  |  | | | | | | | | | GYP: Grain yield per plant (g) | | | | | | | | | |
|  |  | | | | | | | | |  | | | | | | | | | |

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**Figure S1. Observed Heterozygosity (Ho), Expected Heterozygosity (He) and Fixation Index (F) observed in the three populations defined by STRUCTURE where, Pop I, Pop II and Pop III represents Population I, Population II and the admixture subgroup respectively. Error bars indicate standard error**

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EWH: Ear weight with husk (g); EWWH: Ear weight without husk (g); EL: Ear length (cm); NK: Number of kernels per row; GYP: Grain yield per plant (g)

**Figure S2. Scattergram of ear related traits in the three populations grouped as per STRUCTURE. The plus indicates mean values and the horizontal line depicts the median values. Pop I, Pop II and Pop III denote Population I, Population II and the admixture subgroup respectively**