Using quantitative PCR with retrotransposon-insertion polymorphisms as markers in sugarcane

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Supplementary Figure 1. Tests of Reproducibility. Bars are the number of alleles with the element present as a ratio out of 10. Error bars are the total difference in Ct values for all replicates (i.e. for all reactions analysed, for both the presence and the absence of the element). Figures show replicates across A. plates, B. Real-Time PCR Systems, C. template concentration, D. primer concentration and E. threshold settings.
Supplementary Figure S1.A
Supplementary Figure S1.C
Supplementary Figure S1.D
Supplementary Figure S1.E
Supplementary Figure S2. UPGMA dendogram of the cultivar series examined from Australia and Brazilian breeding programs; the RB series from RIDESA, Brazil; the SP series from CTC (Centro de Technologia Canaveira), Brazil; Q-canes from SRA (Sugar Research Australia), Australia and the F series, a population from RIDESA, Brazil. The dotted line indicates the division between chiefly RB cultivars and all other cultivars.
| Genus/ species | cultivar/accession | Parent 1 | Parent 2 | Loci 11K15 | Loci 15015 | Loci 44D02 | Real-Time PCR system used | Provenance | Sucrose content | Fibre content | Smut | Brown rust | Leaf scald | Sugarcane Mosaci Virus (SGMV) |
|----------------|-------------------|----------|----------|------------|------------|------------|--------------------------|------------|----------------|--------------|------|-------------|-----------|----------------------------|
| Cultivar       | 87S803Z           |          |          | 3.48       | 6.16       | 1.80       | Real-Time PCR system used | Provenance | Sucrose content | Fibre content | Smut | Brown rust | Leaf scald | Sugarcane Mosaci Virus (SGMV) |
| Cultivar       | 87S9021           |          |          | 4.04       | 4.81       | 5.40       | Real-Time PCR system used | Provenance | Sucrose content | Fibre content | Smut | Brown rust | Leaf scald | Sugarcane Mosaci Virus (SGMV) |
| Cultivar       | 89W130            |          |          | 7.64       | 7.86       | 1.84       | Real-Time PCR system used | Provenance | Sucrose content | Fibre content | Smut | Brown rust | Leaf scald | Sugarcane Mosaci Virus (SGMV) |
| Cultivar       | 91C511            |          |          | 5.00       | 4.51       | 2.87       | Real-Time PCR system used | Provenance | Sucrose content | Fibre content | Smut | Brown rust | Leaf scald | Sugarcane Mosaci Virus (SGMV) |
| Cultivar       | 91C982            |          |          | 5.27       | 2.89       | 2.80       | Real-Time PCR system used | Provenance | Sucrose content | Fibre content | Smut | Brown rust | Leaf scald | Sugarcane Mosaci Virus (SGMV) |
| Cultivar       | CB40-13 POJ2878 Co290 |          |          | 4.96       | 3.88       | 4.74       | Real-Time PCR system used | Provenance | Sucrose content | Fibre content | Smut | Brown rust | Leaf scald | Sugarcane Mosaci Virus (SGMV) |
| Cultivar       | CB41-76 POJ2878   |          |          | 2.52       | 4.17       | 5.27       | Real-Time PCR system used | Provenance | Sucrose content | Fibre content | Smut | Brown rust | Leaf scald | Sugarcane Mosaci Virus (SGMV) |
| Cultivar       | CB47-355 POJ2878 Co413 |          |          | 3.23       | 7.10       | 4.81       | Real-Time PCR system used | Provenance | Sucrose content | Fibre content | Smut | Brown rust | Leaf scald | Sugarcane Mosaci Virus (SGMV) |
| Cultivar       | CB53-98 CB46-40 |          |          | 6.28       | 4.07       | 5.12       | Real-Time PCR system used | Provenance | Sucrose content | Fibre content | Smut | Brown rust | Leaf scald | Sugarcane Mosaci Virus (SGMV) |
| Cultivar       | CO1007            |          |          | 2.90       | 3.70       | 3.88       | Real-Time PCR system used | Provenance | Sucrose content | Fibre content | Smut | Brown rust | Leaf scald | Sugarcane Mosaci Virus (SGMV) |
| Cultivar       | Co419 POJ2878 Co290 |          |          | 4.25       | 6.43       | 5.62       | Real-Time PCR system used | Provenance | Sucrose content | Fibre content | Smut | Brown rust | Leaf scald | Sugarcane Mosaci Virus (SGMV) |
| Cultivar       | Co449 POJ2878 Co331 |          |          | 5.53       | 4.45       | 3.23       | Real-Time PCR system used | Provenance | Sucrose content | Fibre content | Smut | Brown rust | Leaf scald | Sugarcane Mosaci Virus (SGMV) |
| Cultivar       | CP51-22 F36-819 CP33-372 |          |          | 5.46       | 4.47       | 2.21       | Real-Time PCR system used | Provenance | Sucrose content | Fibre content | Smut | Brown rust | Leaf scald | Sugarcane Mosaci Virus (SGMV) |
| Cultivar       | CP52-68 CP29-320 |          |          | 5.33       | 8.90       | 5.40       | Real-Time PCR system used | Provenance | Sucrose content | Fibre content | Smut | Brown rust | Leaf scald | Sugarcane Mosaci Virus (SGMV) |
| Cultivar       | CP74-2005 EK2 POJ100 |          |          | 1.61       | 3.96       | 0.00       | Real-Time PCR system used | Provenance | Sucrose content | Fibre content | Smut | Brown rust | Leaf scald | Sugarcane Mosaci Virus (SGMV) |
| Cultivar       | EK28 EK2 POJ100 |          |          | 0.00       | 5.83       | 4.75       | Real-Time PCR system used | Provenance | Sucrose content | Fibre content | Smut | Brown rust | Leaf scald | Sugarcane Mosaci Virus (SGMV) |
| Cultivar       | F01 SP80-3280 RB835486 |          |          | 6.32       | 4.08       | 2.31       | Real-Time PCR system used | Provenance | Sucrose content | Fibre content | Smut | Brown rust | Leaf scald | Sugarcane Mosaci Virus (SGMV) |
| Cultivar       | F02 SP80-3280 RB835486 |          |          | 5.56       | 5.19       | 2.41       | Real-Time PCR system used | Provenance | Sucrose content | Fibre content | Smut | Brown rust | Leaf scald | Sugarcane Mosaci Virus (SGMV) |
| Cultivar       | F03 SP80-3280 RB835486 |          |          | 7.09       | 7.97       | 2.24       | Real-Time PCR system used | Provenance | Sucrose content | Fibre content | Smut | Brown rust | Leaf scald | Sugarcane Mosaci Virus (SGMV) |
| Cultivar       | F04 SP80-3280 RB835486 |          |          | 4.42       | 6.09       | 1.93       | Real-Time PCR system used | Provenance | Sucrose content | Fibre content | Smut | Brown rust | Leaf scald | Sugarcane Mosaci Virus (SGMV) |
| Cultivar       | F05 SP80-3280 RB835486 |          |          | 6.06       | 3.36       | 3.18       | Real-Time PCR system used | Provenance | Sucrose content | Fibre content | Smut | Brown rust | Leaf scald | Sugarcane Mosaci Virus (SGMV) |
| Cultivar       | F06 SP80-3280 RB835486 |          |          | 4.10       | 7.60       | 2.78       | Real-Time PCR system used | Provenance | Sucrose content | Fibre content | Smut | Brown rust | Leaf scald | Sugarcane Mosaci Virus (SGMV) |
| Cultivar       | F07 SP80-3280 RB835486 |          |          | 3.73       | 6.67       | 2.05       | Real-Time PCR system used | Provenance | Sucrose content | Fibre content | Smut | Brown rust | Leaf scald | Sugarcane Mosaci Virus (SGMV) |
| Cultivar       | F08 SP80-3280 RB835486 |          |          | 5.11       | 3.32       | 2.93       | Real-Time PCR system used | Provenance | Sucrose content | Fibre content | Smut | Brown rust | Leaf scald | Sugarcane Mosaci Virus (SGMV) |
| Cultivar       | F09 SP80-3280 RB835486 |          |          | 6.90       | 4.89       | 2.45       | Real-Time PCR system used | Provenance | Sucrose content | Fibre content | Smut | Brown rust | Leaf scald | Sugarcane Mosaci Virus (SGMV) |
| Cultivar       | F10 SP80-3280 RB835486 |          |          | 7.37       | 5.70       | 2.08       | Real-Time PCR system used | Provenance | Sucrose content | Fibre content | Smut | Brown rust | Leaf scald | Sugarcane Mosaci Virus (SGMV) |
| Cultivar       | F31-962 Co-281 CP27-108 |          |          | 5.11       | 7.08       | 6.43       | Real-Time PCR system used | Provenance | Sucrose content | Fibre content | Smut | Brown rust | Leaf scald | Sugarcane Mosaci Virus (SGMV) |
| Cultivar       | F36-819 F31-962 POJ2878 |          |          | 5.85       | 2.92       | 5.19       | Real-Time PCR system used | Provenance | Sucrose content | Fibre content | Smut | Brown rust | Leaf scald | Sugarcane Mosaci Virus (SGMV) |
| Genus/ species | cultivar/ accession | Parent 1 | Parent 2 | Loci 1 | Loci 15015 | Loci 44D02 | Real-Time PCR system used | Provenance | Sucrose content | Fibre content | Smut | Brown rust | Leaf scald | Sugarcane Mosasi Virus (SGMV) |
|----------------|---------------------|----------|----------|--------|------------|------------|-----------------------------|------------|----------------|--------------|------|-------------|-----------|-----------------------------|
| Cultivar       | H53-3989            | H48-3717 | ?        | 2.89   | 6.30       | 4.40       | 700                         | Hawaii     |                |              |      |             |           |                             |
| Cultivar       | H59-1966            | H50-676  | H49-3646 | 5.28   | 3.84       | 4.26       | 700                         | Hawaii     |                |              |      |             |           |                             |
| Cultivar       | IAC50-134           | Co419    | Co285    | 2.93   | 2.42       | 7.03       | 700                         | Brazil     | 2              |              |      | 1           |           |                             |
| Cultivar       | IAC51-205           | POJ2878  | ?        | 4.53   | 0.82       | 6.05       | 700                         | Brazil     | 1              |              |      | 1           |           |                             |
| Cultivar       | IAC52-150           | Co419    | Co285    | 5.68   | 5.37       | 6.02       | 700                         | Brazil     | 4              |              |      |             |           |                             |
| Cultivar       | IAC64-257           | Co419    | IAC49-131| 4.30   | 6.87       | 4.79       | 700                         | Brazil     | 2              |              |      | 1           |           |                             |
| Cultivar       | IAC68-12            | Co419    | IAC52-179| 6.34   | 7.13       | 4.93       | 700                         | Brazil     | 4              |              |      |             |           |                             |
| Cultivar       | IAC82-3092          | CB41-76  | IAC68-12 | 6.35   | 4.83       | 6.36       | 700                         | Brazil     | 1              | 1            |      |             |           |                             |
| Cultivar       | IAC83-4157          | IAC68-12 | SP70-1143| 5.52   | 4.64       | 5.71       | 700                         | Brazil     | 1              |              |      | 1           |           |                             |
| Cultivar       | IAC86-2210          | CP52-48  | Co798    | 4.41   | 4.58       | 0.02       | 700                         | Brazil     | 5              |              |      | 1           |           |                             |
| Cultivar       | IAC91-1099          | RB785148 | ?        | 4.88   | 4.28       | 3.30       | 700                         | Brazil     | 2              |              |      |             |           |                             |
| Cultivar       | MIDA                |          |          | 5.48   | 4.83       | 3.93       | ViIA                        |           |                |              |      |             |           |                             |
| Cultivar       | NA56-79             | Co419    | Co419    | 3.35   | 2.50       | 5.19       | 700                         | Argentina  |                |              |      |             |           | intermediaria               |
| Cultivar       | Nco310              | Co421    | Co312    | 5.78   | 5.56       | 3.52       | 700                         | India      |                |              |      |             |           |                             |
| Cultivar       | POJ2878             | POJ2364  | EK28     | 4.40   | 3.84       | 7.01       | 700                         | Java       |                |              |      |             |           |                             |
| Cultivar       | Q124                | Nco310   | QN54-7096| 4.04   | 3.85       | 4.94       | ViIA                        | Queensland, Australia | 6              | 1            | 1            | 7          |                             |
| Cultivar       | Q142                |          |          | 4.57   | 2.17       | 3.66       | ViIA                        | Queensland, Australia | 4              | 2            | 1            |           |                             |
| Cultivar       | Q165                | Nco310   |          | 5.60   | 4.59       | 3.53       | ViIA                        | Queensland, Australia | 8              | 3            | 1            |           |                             |
| Cultivar       | Q172                | Q99      | H49-3666 | 4.00   | 5.16       | 5.79       | ViIA                        | Queensland, Australia | 4              | unknown      | 1            |           |                             |
| Cultivar       | Q173                |          |          | 4.10   | 5.74       | 5.16       | ViIA                        | Queensland, Australia | 4              | 2            | 5            |           |                             |
| Cultivar       | Q186                |          |          | 6.60   | 3.36       | 5.77       | ViIA                        | Queensland, Australia |                |              |              |           |                             |
| Cultivar       | Q193                | CP51-21  | Q121     | 1.86   | 5.76       | 5.76       | ViIA                        | Queensland, Australia | 9              | unknown      | 1            | 4          |                             |
| Cultivar       | Q198                |          |          | 2.65   | 5.16       | 3.57       | ViIA                        | Queensland, Australia |                |              |              |           |                             |
| Cultivar       | Q200                | QN23-1700| QN66-2008| 5.22   | 2.23       | 2.24       | ViIA                        | Queensland, Australia | 1              | 1            | 1            | 1          |                             |
| Cultivar       | Q201                |          |          | 2.54   | 1.77       | 4.76       | ViIA                        | Queensland, Australia | 7              |              | 2            | 8          |                             |
| Cultivar       | Q208                | Q135     | QN61-1232| 5.57   | 6.94       | 1.95       | ViIA                        | Queensland, Australia | 4              | 1            | 1            | 1          |                             |
| Cultivar       | Q212                | Q138     | H56-752  | 7.63   | 8.10       | 1.70       | ViIA                        | Queensland, Australia | 1              | 6            | 1            |           |                             |
| Cultivar       | Q217                |          |          | 4.05   | 4.51       | 4.04       | ViIA                        | Queensland, Australia | 8              |              | 1            | 1          |                             |
| Genus/ species | cultivar/ accession | Parent 1 | Parent 2 | Loci 11K15 | Loci 15015 | Loci 44D02 | Real-Time PCR system used | Provenance | Sugarcane Mosac Virus (SGMV) |
|----------------|---------------------|----------|----------|------------|------------|------------|----------------------------|-------------|-----------------------------|
| Cultivar       | Q221                |          |          | 5.54       | 5.15       | 6.10       | ViIA                       | Queensland, Australia | 7 | 5 | 1 |
| Cultivar       | Q99                 |          |          | 5.41       | 5.03       | 5.90       | ViIA                       | Queensland, Australia |  |   |   |
| Cultivar       | R570                | H32-8560 | R445     | 1.70       | 2.03       | 3.59       | 700                       | Reunion         |  |   |   |
| Cultivar       | RB721012            | Co331    | ?        | 4.44       | 1.54       | 4.69       | 700                       | RIDES, Brazil     | 2 | 3 | 1 | 6 | 1 | 1 |
| Cultivar       | RB72199             | NCo334   | ?        | 2.65       | 1.92       | 7.18       | 700                       | RIDES, Brazil     | 2 | 3 | 1 | 1 | 2 | 1 |
| Cultivar       | RB72454             | CP53-76  | ?        | 3.59       | 2.97       | 6.13       | 700                       | RIDES, Brazil     | 2 | 3 | 1 | 1 | 2 | 1 |
| Cultivar       | RB725053            | Co775    | ?        | 5.06       | 2.73       | 5.66       | 700                       | RIDES, Brazil     | 2 | 3 | 5 | 7 | 2 | 6 |
| Cultivar       | RB725828            | NA56-79  | ?        | 2.61       | 1.52       | 4.95       | 700                       | RIDES, Brazil     | 2 | 3 | ? | ? | 1 | ? |
| Cultivar       | RB732577            | Co331    | ?        | 4.06       | 3.63       | 3.85       | 700                       | RIDES, Brazil     | 2 | 3 | ? | ? | ? | ? |
| Cultivar       | RB735200            |          |          | 4.01       | 1.54       | 5.92       | 700                       | RIDES, Brazil     | 2 | 3 | 1 | 1 | 1 | 1 |
| Cultivar       | RB735220            | CB61-99  | ?        | 5.07       | 5.05       | 5.52       | 700                       | RIDES, Brazil     | 2 | 3 | 1 | 1 | 1 | 1 |
| Cultivar       | RB735275            | IAC49-131| ?        | 1.35       | 8.05       | 5.38       | 700                       | RIDES, Brazil     | 4 | 3 | 2 | 1 | 2 | 2 |
| Cultivar       | RB739359            | IANE55-34| ?        | 7.54       | 1.45       | 5.44       | 700                       | RIDES, Brazil     | 2 | 3 | 5 | 3 | 2 | 2 |
| Cultivar       | RB739735            | CB52-179 | ?        | 3.91       | 3.24       | 3.60       | 700                       | RIDES, Brazil     | 2 | 3 | 5 | 3 | 2 | 2 |
| Cultivar       | RB75126             | C278     | ?        | 3.12       | 1.88       | 3.61       | 700                       | RIDES, Brazil     | 4 | 3 | 1 | 1 | 1 | ? |
| Cultivar       | RB765418            | M253/48  | ?        | 4.25       | 4.30       | 3.15       | 700                       | RIDES, Brazil     | 2 | 3 | 1 | 1 | 1 | 3 |
| Cultivar       | RB785148            | IAC47-31 | ?        | 4.81       | 3.60       | 4.44       | 700                       | RIDES, Brazil     | 4 | 3 | 5 | 1 | 2 | 3 |
| Cultivar       | RB825317            | L60-14   | CB47-355 | 2.14       | 5.22       | 4.69       | 700                       | RIDES, Brazil     | 4 | 1 | 1 | 1 | 1 | 1 |
| cultivar       | RB825336            | H53-3989 | ?        | 2.31       | 6.49       | 2.38       | 700                       | RIDES, Brazil     | 4 | 1 | 1 | 1 | 1 | 1 |
| Cultivar       | RB835019            | RB72454  | NA56-79  | 2.35       | 2.56       | 4.22       | 700                       | RIDES, Brazil     | 2 | 1 | 5 | 1 | 1 | 1 |
| cultivar       | RB835089            | RB72454  | NA56-79  | 3.81       | 1.40       | 7.44       | 700                       | RIDES, Brazil     | 4 | 3 | 1 | 1 | 1 | 3 |
| Cultivar       | RB835205            | Co740    | ?        | 5.27       | 2.80       | 1.98       | 700                       | RIDES, Brazil     | 4 | 3 | 5 | 3 | 2 | 3 |
| Cultivar       | RB845197            | RB72454  | SP70-1143| 2.06       | 3.62       | 5.13       | 700                       | RIDES, Brazil     | 4 | 3 | 5 | 3 | 2 | 3 |
| cultivar       | RB845210            | RB72454  | SP70-1143| 3.87       | 2.89       | 6.16       | 700                       | RIDES, Brazil     | 2 | 3 | 1 | 1 | 1 | 1 |
| cultivar       | RB845257            | RB72454  | SP70-1143| 2.72       | 3.61       | 5.15       | 700                       | RIDES, Brazil     | 2 | 3 | 1 | 1 | 1 | 1 |
| Cultivar       | RB855002            | SP70-1143| RB72454 | 2.50       | 4.25       | 5.69       | 700                       | RIDES, Brazil     | 2 | 3 | 1 | 1 | 1 | 1 |
| cultivar       | RB855035            | L60-14   | SP70-1284| 5.18       | 2.61       | 3.81       | 700                       | RIDES, Brazil     | 2 | 3 | 1 | 5 | 1 | 1 |
| cultivar       | RB855036            | RB72454  | SP70-1143| 3.65       | 5.58       | 5.23       | 700                       | RIDES, Brazil     | 4 | 3 | 1 | 1 | 1 | 1 |
### Supplementary Table S1.xlsx

| Genus/ species | cultivar/ accession | Parent 1 | Parent 2 | Loci 11K15 | Loci 15015 | Loci 44D02 | Real-Time PCR system used | Provenance | Sucrose content | Fibre content | Smut | Brown rust | Leaf scald | Sugarcane Mosasi Virus (SGMV) |
|----------------|---------------------|----------|----------|------------|------------|------------|--------------------------|------------|----------------|--------------|-----|-----------|-----------|-----------------------------|
| Cultivar       | RB855077            | SP70-1143| TUC71-7  | 1.35       | 6.04       | 3.55       | 700 RIDESA, Brazil        |            |                |              |     |           |           |                             |
| Cultivar       | RB855113            | SP70-1143| RB72454  | 4.13       | 4.19       | 4.69       | 700 RIDESA, Brazil        |            |                |              | 2   | 5         | 1         | 1              | 1                     |
| cultivar       | RB855156            | RB72454  | TUC71-7  | 1.15       | 3.00       | 3.86       | 700 RIDESA, Brazil        |            |                |              | 2   | 5         | 1         | 1              | 1                     |
| Cultivar       | RB855350            | RB72454  | ?        | 4.62       | 3.04       | 3.48       | 700 RIDESA, Brazil        |            |                |              |     |           |           |                             |
| cultivar       | RB855453            | TUC71-7  | ?        | 1.60       | 3.29       | 4.15       | 700 RIDESA, Brazil        |            |                |              | 1   | 3         | 1         | 1              | 1                     |
| Cultivar       | RB855463            | RB72454  | ?        | 3.93       | 3.77       | 5.64       | 700 RIDESA, Brazil        |            |                |              | 2   | 3         | 1         | 1              | 1                     |
| cultivar       | RB855465            | RB72454  | ?        | 1.25       | 3.31       | 2.20       | 700 RIDESA, Brazil        |            |                |              |     |           |           |                             |
| Cultivar       | RB855511            | SP71-1406| ?        | 4.78       | 2.07       | 5.16       | 700 RIDESA, Brazil        |            |                |              | 4   | 3         | 1         | 2              | 1                     |
| Cultivar       | RB855563            | TUC71-7  | SP70-1143| 3.35       | 3.33       | 2.88       | 700 RIDESA, Brazil        |            |                |              | 2   | 3         | 1         | 3              | 1                     |
| Cultivar       | RB855595            | SP70-1143| TUC71-7  | 4.36       | 4.64       | 2.31       | 700 RIDESA, Brazil        |            |                |              |     |           |           |                             |
| cultivar       | RB925211            | RB855206 | ?        | 3.50       | 2.18       | 4.20       | 700 RIDESA, Brazil        |            |                |              | 4   | 2         | 1         | 1              | 1                     |
| cultivar       | RB925268            | RB85511  | ?        | 6.18       | 4.08       | 5.47       | 700 RIDESA, Brazil        |            |                |              | 4   | 3         | 1         | 1              | 1                     |
| Cultivar       | RB92579             | RB75126  | RB72199  | 5.93       | 1.76       | 5.93       | 700 RIDESA, Brazil        |            |                |              | 2   | 3         | ?         | 3              | 1                     |
| cultivar       | RB935744            | RB835089 | RB765418 | 6.91       | 3.62       | 5.62       | 700 RIDESA, Brazil        |            |                |              | 4   | 3         | 1         | 1              | 5                     |
| cultivar       | RB965902            | RB85536  | RB85543  | 5.64       | 0.60       | 5.70       | 700 RIDESA, Brazil        |            |                |              | 2   | 3         | 1         | 1              | 1                     |
| cultivar       | RB965917            | RB855453 | RB855536| 2.61       | 4.31       | 3.48       | 700 RIDESA, Brazil        |            |                |              | 2   | 3         | 1         | 1              | 1                     |
| Cultivar       | RB966928            | RB855156| RB815690 | 4.83       | 2.48       | 5.22       | 700 RIDESA, Brazil        |            |                |              | 4   | 3         | 5         | 2              | 3                     |
| Cultivar       | SP70-1078           | IAC48-65 | ?        | 5.00       | 2.38       | 2.09       | 700 CTC, Brazil           |            |                |              |     |           |           | 1              |                       |
| Cultivar       | SP70-1143           | IAC48-65 | ?        | 3.48       | 7.71       | 6.02       | 700 CTC, Brazil           |            |                |              |     |           |           | 1              |                       |
| Cultivar       | SP70-1284           | CB41-76  | ?        | 4.64       | 5.43       | 3.29       | 700 CTC, Brazil           |            |                |              |     |           |           | 1              |                       |
| Cultivar       | SP70-1423           | CB41-76  | ?        | 4.20       | 5.17       | 3.36       | 700 CTC, Brazil           |            |                |              |     |           |           | 1              |                       |
| Cultivar       | SP70-3370           | CP53-17  | ?        | 4.99       | 3.51       | 4.22       | 700 CTC, Brazil           |            |                |              |     |           | 1         | 1              |                       |
| Cultivar       | SP71-6163           | NA56-79  | ?        | 6.01       | 6.59       | 5.05       | 700 CTC, Brazil           |            |                |              |     |           |           | 1              |                       |
| Cultivar       | SP71-6949           | NA56-79  | ?        | 5.04       | 4.10       | 4.57       | 700 CTC, Brazil           |            |                |              |     |           |           | 1              |                       |
| Cultivar       | SP79-1011           | NA56-79  | Co775    | 4.99       | 3.31       | 2.24       | 700 CTC, Brazil           |            |                |              | 2   | 3         | 3         | 1              |                       |
| Cultivar       | SP79-2233           | H56-2954 | ?        | 4.55       | 4.02       | 2.55       | 700 CTC, Brazil           |            |                |              | 2   |           |           |                 |                       |
| Cultivar       | SP79-2312           | SP71-6106| ?        | 5.44       | 6.33       | 2.47       | 700 CTC, Brazil           |            |                |              |     |           |           |                 |                       |
| Cultivar       | SP79-2313           | SP71-6106| ?        | 4.71       | 6.45       | 2.52       | 700 CTC, Brazil           |            |                |              |     |           |           |                 |                       |
| Genus/ species | cultivar/ accession | Parent 1 | Parent 2 | Loci 11K15 | Loci 15015 | Loci 44D02 | Real-Time PCR system used | Provenance | Sucrose content | Fibre content | Smut | Brown rust | Leaf scald | Sugarcane Mosaci Virus (SGMV) |
|----------------|---------------------|----------|----------|------------|------------|------------|---------------------------|------------|----------------|--------------|------|------------|----------|-----------------------------|
| Cultivar       | SP79-6134           | H63-4644 | ?        | 5.85       | 7.65       | 0.00       | 700                       | CTC, Brazil | 5.85           | 7.65         | 0.00 | 700        | 2        | CTC, Brazil                  |
| Cultivar       | SP79-6192           | SP70-3518 | ?        | 3.85       | 5.36       | 0.00       | 700                       | CTC, Brazil | 2              | 3            | 2    | 1          | 1        | CTC, Brazil                  |
| Cultivar       | SP80-1520           | H48-3166 | SP71-1088 | 3.85 | 5.67 | 5.03 | 700 | CTC, Brazil | 2 | 5 | 5 | 1 | 1 | 1 | CTC, Brazil |
| Cultivar       | SP80-1816           | SP71-1088 | H57-5028 | 6.40 | 3.18 | 4.37 | 700 | CTC, Brazil | 2 | 1 | 5 | 3 | 2 | 1 | CTC, Brazil |
| Cultivar       | SP80-1836           | SP71-1088 | H57-5028 | 7.59 | 5.30 | 5.22 | 700 | CTC, Brazil | 2 | 5 | 5 | 1 | 1 | 1 | CTC, Brazil |
| Cultivar       | SP80-1842           | SP71-1088 | H57-5028 | 6.19 | 2.81 | 5.79 | 700 | CTC, Brazil | 2 | 5 | 5 | 1 | 1 | 1 | CTC, Brazil |
| Cultivar       | SP80-3280           | SP71-1088 | H57-5028 | 5.13 | 3.92 | 4.43 | 700 | CTC, Brazil | 2 | 1 | 1 | 1 | 2 | 1 | CTC, Brazil |
| Cultivar       | SP81-3250           | CP70-1547 | SP71-1279 | 5.77 | 3.77 | 6.71 | 700 | CTC, Brazil | 2 | 1 | 8 | 1 | 4 | 1 | CTC, Brazil |
| Cultivar       | SP83-5073           | SP71-1406 | SP71-1088 | 4.37 | 3.09 | 6.37 | 700 | CTC, Brazil | 2 | 1 | 4 | 1 | 1 | 1 | CTC, Brazil |
| Cultivar       | SP89-1115           | CP73-1547 | ?        | 4.28 | 5.82 | 0.00 | 700 | CTC, Brazil | 2 | 5 | 1 | 1 | 1 | 1 | CTC, Brazil |
| Cultivar       | SP91-1049           | SP80-3328 | SP81-3250 | 5.09 | 7.28 | 4.81 | 700 | CTC, Brazil | 2 | 3 | 7 | 1 | 4 | 1 | CTC, Brazil |
| Cultivar       | Tellus              |          |          | 3.86 | 5.28 | 2.33 | ViiA |          | 4 | 1 | 1 | 1 | 1 | 1 | CTC, Brazil |
| Cultivar       | Triton              |          |          | 4.75 | 2.31 | 5.67 | ViiA |          | 4 | 1 | 1 | 1 | 1 | 1 | CTC, Brazil |
| Cultivar       | Trojan              | Co270    | S. officinarum | 5.08 | 3.15 | 5.93 | ViiA |          | 4 | 1 | 1 | 1 | 1 | 1 | CTC, Brazil |
| Cultivar       | TUC71-7             | CP52-68  | CP62-258 | 1.22 | 2.70 | 2.36 | 700 | Argentina |          | 4 | 1 | 1 | 1 | 1 | 1 | CTC, Brazil |
| Erianthus      | Hainan 92-108       |          |          | 0.00 | 0.00 | 0.00 | ViiA | China     | 4 | 1 | 1 | 1 | 1 | 1 | CTC, Brazil |
| Erianthus      | Hainan 92-79        |          |          | 0.00 | 0.00 | 0.00 | ViiA | China     | 4 | 1 | 1 | 1 | 1 | 1 | CTC, Brazil |
| Erianthus      | Hainan 92-80        |          |          | 0.00 | 0.00 | 0.00 | ViiA | China     | 4 | 1 | 1 | 1 | 1 | 1 | CTC, Brazil |
| Erianthus      | Sichuan 92-19       |          |          | 0.00 | 0.00 | 0.00 | ViiA | China     | 4 | 1 | 1 | 1 | 1 | 1 | CTC, Brazil |
| Erianthus      | Yu 83-198           |          |          | 0.00 | 0.00 | 0.00 | ViiA | China     | 4 | 1 | 1 | 1 | 1 | 1 | CTC, Brazil |
| Miscanthus     | Barola              |          |          | 0.00 | 0.00 | 0.00 | ViiA | Indonesia | 4 | 1 | 1 | 1 | 1 | 1 | CTC, Brazil |
| Miscanthus     | Kamanofi            |          |          | 0.00 | 0.00 | 0.00 | ViiA | Indonesia | 4 | 1 | 1 | 1 | 1 | 1 | CTC, Brazil |
| Miscanthus     | Komperi             |          |          | 0.00 | 0.00 | 0.00 | ViiA | Indonesia | 4 | 1 | 1 | 1 | 1 | 1 | CTC, Brazil |
| Miscanthus     | Ofare               |          |          | 0.00 | 0.00 | 0.00 | ViiA | Indonesia | 4 | 1 | 1 | 1 | 1 | 1 | CTC, Brazil |
| Miscanthus     | Teca                |          |          | 0.00 | 0.00 | 0.00 | ViiA | Indonesia | 4 | 1 | 1 | 1 | 1 | 1 | CTC, Brazil |
| S. barberi     | Chunnee             |          |          | 0.43 | 1.44 | 0.00 | 700 |          | 4 | 1 | 1 | 1 | 1 | 1 | CTC, Brazil |
| S. edule       | NG57-164            |          |          | 0.00 | 3.56 | 0.00 | ViiA | New Guinea | 4 | 1 | 1 | 1 | 1 | 1 | CTC, Brazil |
| S. edule       | NH70-0339           |          |          | 0.00 | 2.33 | 0.00 | ViiA | New Hebrides | 4 | 1 | 1 | 1 | 1 | 1 | CTC, Brazil |
| Genus/species | cultivar/accession | Parent 1 | Parent 2 | Loci  | Loci  | Loci  | Real-Time PCR system used | Provenance | Sucrose content | Fibre content | Smut | Brown rust | Leaf scald | Sugarcane Mosaci Virus (SGMV) |
|--------------|--------------------|----------|----------|-------|-------|-------|---------------------------|------------|----------------|--------------|------|------------|-----------|---------------------------|
| S. edule     | SE15               |          |          | 0.00  | 8.55 | 0.00  | ViiA                      |            |                |              |      |            |           |                           |
| S. officinarium | Badilla          | 6.33     | 6.28     | 5.01  |      | 700   | New Guinea                |            |                |              |      |            |           |                           |
| S. officinarium | Black Tanna      | 2.64     | 6.92     | 4.90  |      |        | ViiA                      |            |                |              |      |            |           |                           |
| S. officinarium | Creoula          | 4.22     | 3.21     | 3.03  |      | 700   |                           |            |                |              |      |            |           |                           |
| S. officinarium | G German         | 3.57     | 4.69     | 4.44  |      | 700   |                           |            |                |              |      |            |           |                           |
| S. officinarium | IEIE              | 1.91     | 2.01     | 2.31  |      |        | ViiA                      | Hawaii     |                |              |      |            |           |                           |
| S. officinarium | IJ76-514         | 2.66     | 7.33     | 4.68  | ViiA |        | Irian Jaya                |            |                |              |      |            |           |                           |
| S. officinarium | IK76-35          | 3.45     | 3.15     | 2.70  | ViiA |        | Kalimantan                |            |                |              |      |            |           |                           |
| S. officinarium | IM76-237         | 2.12     | 2.59     | 3.04  | ViiA |        | Maluku, Indonesia         |            |                |              |      |            |           |                           |
| S. officinarium | Korpi             | 4.21     | 3.89     | 3.48  | ViiA |        | New Guinea                |            |                |              |      |            |           |                           |
| S. officinarium | NG21-3           | 7.82     | 6.38     | 2.65  | ViiA |        | New Guinea                |            |                |              |      |            |           |                           |
| S. officinarium | NG21-5           | 3.99     | 1.27     | 5.94  | ViiA |        | New Guinea                |            |                |              |      |            |           |                           |
| S. robustum  | IJ76-416         | 0.00     | 1.68     | 0.00  | ViiA |        | Irian Jaya                |            |                |              |      |            |           |                           |
| S. robustum  | IJ76-422         | 0.00     | 4.25     | 0.00  | ViiA |        | Irian Jaya                |            |                |              |      |            |           |                           |
| S. robustum  | IJ76-507         | 0.00     | 0.00     | 0.00  | ViiA |        | Irian Jaya                |            |                |              |      |            |           |                           |
| S. robustum  | IJ76-534         | 0.00     | 2.80     | 0.00  | ViiA |        | Irian Jaya                |            |                |              |      |            |           |                           |
| S. robustum  | IM76-229         | 0.00     | 0.00     | 0.00  | ViiA |        | Maluku, Indonesia         |            |                |              |      |            |           |                           |
| S. robustum  | IS76-184         | 0.00     | 7.15     | 0.00  | ViiA |        | Sulawesi, Indonesia       |            |                |              |      |            |           |                           |
| S. robustum  | MOL-4200         | 0.00     | 6.56     | 0.00  | ViiA |        |                           |            |                |              |      |            |           |                           |
| S. robustum  | MOL-4943         | 0.00     | 7.47     | 0.00  | ViiA |        |                           |            |                |              |      |            |           |                           |
| S. robustum  | NG47-208         | 0.00     | 2.84     | 0.00  | ViiA |        | New Guinea                |            |                |              |      |            |           |                           |
| S. robustum  | T.T. Tengarron   | 0.00     | 7.22     | 0.00  | ViiA |        |                           |            |                |              |      |            |           |                           |
| S. sinense   | Maneira           | 2.96     | 7.90     | 4.40  | 700  |        |                           |            |                |              |      |            |           |                           |
| S. spontaneum | Coimbatore       | 0.00     | 0.00     | 0.00  | ViiA |        | Coimbatore, India         |            |                |              |      |            |           |                           |
| S. spontaneum | IK76-49          | 0.00     | 0.00     | 0.00  | ViiA |        | Kalimantan                |            |                |              |      |            |           |                           |
| S. spontaneum | IS76-132         | 0.00     | 0.00     | 0.00  | ViiA |        | Sulawesi, Indonesia       |            |                |              |      |            |           |                           |
| S. spontaneum | Mandalay         | 0.00     | 0.00     | 0.00  | ViiA |        |                           |            |                |              |      |            |           |                           |
| S. spontaneum | Rellegadi        | 0.00     | 0.00     | 0.00  | ViiA |        |                           |            |                |              |      |            |           |                           |
### Supplementary Table S1: Samples examined; species; cultivar/accession number; parentage; proportion of alleles at the three loci. BAC SCHRBa_011_K15 (scIvana 1.1), BAC SCHRBa_044_D02 (scIvana 1.2) and BAC SCHRBa_015_O15 (scIvana 1.4), with the scIvana element present; Real-Time system used; provenance; sucrose content, fibre content and susceptibility to smut, brown rust, leaf scald and sugarcane mosaic virus. Estimates of the ratio of alleles with the elements to alleles without the element were transformed into a total of 10. Only the value for the presence of the element is shown. Data taken mainly from (Cesnik and Miocque, 2004; Aitken et al., 2006; Variedades RB de cana-de-acúcar, 2008, Catálogo nacional de variedades “RB” de cana-de-acúca, 2010; Landell and Bressiani, 2008; Santos, 2008; Cheavegatti-Gianotto et al., 2011). Traits are shown as a scale: Sucrose content: 1, very high; 2, high; 3, good; 4, average; Fibre content: 1, high; 2, average-high; 3, average; 4, good; 5, low; Smut: 1, resistant; 2, highly tolerant; 3, tolerant; 4, intermediate-resistant; 5, tolerant; 6, intermediate-susceptible; 7, moderately-susceptible; 8, susceptible; 9, highly-susceptible; Brown rust: 1, resistant; 2, highly-tolerant; 3, tolerant; 4, intermediate; Leaf-scalld: 1, resistant; 2, tolerant; 3, intermediate-average; 4, average; Sugarcane mosaic virus: 1, resistant; 2, highly tolerant; 3, tolerant; 4, intermediate-resistant; 5, intermediate-average; 6, moderately-susceptible; 7, susceptible.

| Genus/ species | cultivar/ accession | Parent 1 | Parent 2 | Loci 1 | Loci 2 | Loci 3 | Provenance | Sucrose content | Fibre content | Smut | Brown rust | Leaf scald | Sugarcane mosaic virus (SGMV) |
|----------------|---------------------|----------|----------|--------|--------|--------|------------|----------------|--------------|------|------------|-----------|-------------------------------|
| S. spontaneum  | Saigon              | 0.00     | 0.00     | 0.00   | 0.00   | 0.00   | ViiA       |                |              |      |            |           |                               |
| S. spontaneum  | SES231              | 0.00     | 0.00     | 0.00   |        |        | ViiA       |                |              |      |            |           |                               |

Supplementary Table S1: Samples examined; species; cultivar/accession number; parentage; proportion of alleles at the three loci. BAC SCHRBa_011_K15 (scIvana 1.1), BAC SCHRBa_044_D02 (scIvana 1.2) and BAC SCHRBa_015_O15 (scIvana 1.4), with the scIvana element present; Real-Time system used; provenance; sucrose content, fibre content and susceptibility to smut, brown rust, leaf scald and sugarcane mosaic virus. Estimates of the ratio of alleles with the elements to alleles without the element were transformed into a total of 10. Only the value for the presence of the element is shown. Data taken mainly from (Cesnik and Miocque, 2004; Aitken et al., 2006; Variedades RB de cana-de-acúcar, 2008, Catálogo nacional de variedades “RB” de cana-de-acúca, 2010; Landell and Bressiani, 2008; Santos, 2008; Cheavegatti-Gianotto et al., 2011). Traits are shown as a scale: Sucrose content: 1, very high; 2, high; 3, good; 4, average; Fibre content: 1, high; 2, average-high; 3, average; 4, good; 5, low; Smut: 1, resistant; 2, highly tolerant; 3, tolerant; 4, intermediate-resistant; 5, tolerant; 6, intermediate-susceptible; 7, moderately-susceptible; 8, susceptible; 9, highly-susceptible; Brown rust: 1, resistant; 2, highly-tolerant; 3, tolerant; 4, intermediate; Leaf-scalld: 1, resistant; 2, tolerant; 3, intermediate-average; 4, average; Sugarcane mosaic virus: 1, resistant; 2, highly tolerant; 3, tolerant; 4, intermediate-resistant; 5, intermediate-average; 6, moderately-susceptible; 7, susceptible.
Supplementary Table S2. Sequences and concentrations of primers and probes used. The primer concentrations are those used in Brazil on the Applied Biosystems 7300 Real-Time PCR system. In Australia, all primers were used at a final concentration of 500nm and reactions were run on an Applied Biosystems ViiA 7 Real-Time PCR system.

| loci                     | transposable element | sequence                          | final concentration (nM) |
|--------------------------|----------------------|-----------------------------------|--------------------------|
| SHCRBa_44D02 - scIvana present | scIvana1.2          | forward primer: ATATGAAAGAGCAGTCGCTGGGT | 300                      |
|                          |                      | reverse primer: AGTCTCATGGCCTCTGAACCTGT | 300                      |
|                          |                      | probe: FAM-TGCCCTGAGGAAGACACTCTGT-BKFQ | 250                      |
| SHCRBa_44D02 - scIvana absent | scIvana1.2         | forward primer: AACGAGTTCGGCGTAGAGGATGTA | 300                      |
|                          |                      | reverse primer: TCTTCAATCTGCCCCGTCGCCTGCTT | 50                       |
|                          |                      | probe: FAM-CYYAAGGATATATAATGCTGGGCCT-BKFQ | 250                      |
| SHCRBa_15015 - scIvana present | scIvana1.4      | forward primer: ATATGAAAGAGCAGTCGCTGGGT | 900                      |
|                          |                      | reverse primer: ACACATTATGACTCTGCCTGCA | 900                      |
|                          |                      | probe: FAM-AGCTGGAGCTGACTAGGACACTAAACCATAA-BKFQ | 250                      |
| SHCRBa_15015 - scIvana absent | scIvana1.4       | forward primer: AACAGACTTGTG AGGAGCAGT AGAT | 900                      |
|                          |                      | reverse primer: ACACATTATGACTCTGCCTGCA | 900                      |
|                          |                      | probe: FAM-AGCTGGAGCTGACTAGGACACTAAACCATAA-BKFQ | 250                      |
| SHCRBa_11K15 - scIvana present | scIvana1.1       | forward primer: ATATGAAAGAGCAGTCGCTGGGT | 500                      |
|                          |                      | reverse primer: AGCGTGTGAGGAAGTGTGTCGCC | 500                      |
|                          |                      | probe: FAM-CTGTACCTAAAACACTATCAGTCGACT-BKFQ | 250                      |
| SHCRBa_11K15 - scIvana absent | scIvana1.1       | forward primer: AACAGAAACTCTGGTACAGAAGA | 500                      |
|                          |                      | reverse primer: TAGTGGAAGTGTGTCCTAAA | 500                      |
|                          |                      | probe: FAM-GAGAAATGCTGATTCTATCCGCCTGCTCT-BKFQ | 250                      |
### Supplementary Table S4

For each group identified by phylogenetic analysis (Supplementary Figure S2), the percentage of cultivars from the Australian and Brazilian breeding programs (RB, SP, Q-canes and the F series) that fall into each trait scale.  

| Trait        | Group 1<sup>b</sup> | Group 2 | Group 1<sup>b</sup> | Group 2 |
|--------------|---------------------|---------|---------------------|---------|
|              | scale<sup>a</sup>  | %       | scale               | %       |
| Sucrose      |                     |         |                     |         |
| content      | 2                   | 100%    | 1                   | 3%      |
|              |                     | 2       | 63%                 |         |
|              |                     | 4       | 34%                 |         |
| Fibre content|                     |         |                     |         |
|              | 3                   | 75%     | 1                   | 18%     |
|              |                     | 5       | 25%                 | 2%      |
|              |                     | 3       | 73%                 |         |
|              |                     | 5       | 6%                  |         |
| Smut         |                     |         |                     |         |
|              | 1                   | 58%     | 1                   | 56%     |
|              | 3                   | 8%      | 2                   | 2%      |
|              | 4                   | 8%      | 4                   | 10%     |
|              | 7                   | 8%      | 5                   | 20%     |
|              | 8                   | 17%     | 6                   | 2%      |
|              |                     | 7       | 5%                  |         |
|              |                     | 8       | 2%                  |         |
|              |                     | 9       | 2%                  |         |
| Brown rust   |                     |         |                     |         |
|              | 1                   | 75%     | 1                   | 73%     |
|              | 3                   | 13%     | 2                   | 3%      |
|              | 6                   | 13%     | 3                   | 12%     |
|              |                     | 4       | 3%                  |         |
|              |                     | 5       | 3%                  |         |
|              |                     | 6       | 3%                  |         |
|              |                     | 7       | 3%                  |         |
| Leaf scald   |                     |         |                     |         |
|              | 1                   | 78%     | 1                   | 63%     |
|              | 3                   | 11%     | 2                   | 30%     |
|              | 4                   | 11%     | 3                   | 3%      |
|              |                     | 4       | 3%                  |         |
|              |                     | 5       | 3%                  |         |
| SGMV         |                     |         |                     |         |
|              | 1                   | 88%     | 1                   | 64%     |
|              | 3                   | 13%     | 2                   | 3%      |
|              |                     | 3       | 12%                 |         |
|              |                     | 4       | 3%                  |         |
|              |                     | 5       | 9%                  |         |
|              |                     | 6       | 3%                  |         |
|              |                     | 7       | 3%                  |         |
|              |                     | 8       | 3%                  |         |

<sup>a</sup>scale: please see legend for Supplementary Table S1.
| BAC     | number | location      | Genome      | chrom | locus | description                             | PANTHER | PFAM  | PFAM  | PFAM  | KOG   | KEGGORTH |
|---------|--------|---------------|-------------|-------|-------|------------------------------------------|---------|-------|-------|-------|-------|-----------|
| SHRBa_011_K15 | 5' to BAC | Sorghum bicolor | 8 | 42417857 | 42418225 | Sobic.008G105700 |        |       |       |       |       |           |
|         | 15632 | 20539 | SHRBa_011_K15.3 | elongation factor Tu |        |       |                                          | PF00009 | PF03144 | PF11987 | KOG1144 |       |           |
|         | Sorghum bicolor | 8 | 42533513 | 42539374 | Sobic.008G106000 | Putative uncharacterized |        |       |       |       |       |           |
|         | Oryza sativa | 12 | 19199289 | 19205165 | LOC_Os12g31880 | translation initiation factor |        |       |       |       |       |           |
|         | 20770 | 23067 | SHCRBa_011_K15.4 | Ureide Permease |        |       |                                          | PF07168 |       |       |       |       |           |
|         | Sorghum bicolor | 8 | 42539020 | 42541559 | Sobic.008G106100 | Putative uncharacterized |        |       |       |       |       |           |
|         | Oryza sativa | 12 | 19161734 | 19165432 | LOC_Os12g31890 | Ureide Permease |        |       |       |       |       |           |
|         | 97619 | 98821 | SHCRBa_011_K15.13 | pinoresinol_reductase_1 |        |       |                                          | PF07168 |       |       |       |       |           |
|         | Sorghum bicolor | 8 | 42768091 | 42771347 | Sobic.008G106700 | similar to isoflavone reductase | PTHR14194 | PF05368 |       |       |       |           |
|         | Zea mays | 3 | 135111818 | 13513286 | GRMZM2G3126116 | pinoresinol reductase | PTHR14194 | PF05368 |       |       |       |           |
|         | 101531 | 106814 | scfvana1.1 |        |       |                                          |         |       |       |       |       |           |
|         | 3' to BAC | Sorghum bicolor | 8 | 42761066 | 42761821 | Sobic.008G106600 | hypothetical |        |       |       |       |       |           |
| SHCRBa_044_D02 | 5' to BAC | Sorghum bicolor | 7 | 61280504 | 61283646 | Sobic.007G192600 | similar to FACT complex subunit SPT16 | PTHR13980 | PF00557 | PF08512 | PF08644 | KOG1189 |           |
|         | Oryza sativa | 8 | 19314778 | 19318231 | LOC_Os08g31240 | FACT complex subunit SPT16 putative expressed | PTHR13980 | PF00557 | PF08512 | PF08644 | KOG1189 |           |
|         | Sorghum bicolor | 7 | 61288124 | 61291009 | Sobic.007G192700 | similar to Os05g0373700 | PTHR21713 | PF00627 | PF01849 |       | KOG2239 | K03626   |
|         | Zea mays | 1 | 60165434 | 60167726 | GRMZM2G0000923 | Nascent polypeptide-associated complex (NAC) alpha/source | PTHR21713 | PF00627 | PF01849 |       | KOG2239 | K03626   |
|         | Zea mays | 1 | 60165870 | 60168057 | GRMZM2G0000923 | hypothetical | PTHR21713 | PF00627 | PF01849 |       | KOG2239 | K03626   |
| Genome           | chrom | begin | end     | locus                       | description                                                                 | PANTHER   | PFAM  | PFAM  | PFAM  | KOG   | KEGGORTH |
|------------------|-------|-------|---------|-----------------------------|----------------------------------------------------------------------------|-----------|-------|-------|-------|-------|-----------|
| Sorghum bicolor  | 7     | 61293371 | 61296157 | Sobic.007G192800             | similar to Nuclear transport factor 2                                      | PTHR12612 | PF02136 |       |       | KOG2104|           |
| Oryza sativa     | 8     | 26535057 | 26537389 | LOC_Os08g42090               | nuclear transport factor putative expressed                                | PTHR12612 | PF02136 |       |       | KOG2104|           |
| Zea mays         | 1     | 194524205  | 194526962 | GRMZM2G401724               | hypothetical                                                                | PTHR12612 | PF02136 |       |       | KOG2104|           |
| Sorghum bicolor  | 7     | 61296187 | 61311504 | Sobic.007G192900             | hypothetical                                                                | PTHR11945 | PF00319 |       |       |       |           |
| Oryza sativa     | 8     | 26518976 | 26529016 | LOC_Os08g41960               | OsMADS37 MADS-box family gene with MIKC* type-box expressed                | PTHR11945 | PF00319 |       |       |       |           |
| Zea mays         | 1     | 194046502  | 194054556 | GRMZM2G159397               | hypothetical                                                                | PTHR11945 | PF00319 |       |       | KOG2104|           |
| Sorghum bicolor  | 7     | 61312378 | 61316071 | Sobic.007G193100             | hypothetical                                                                | PTHR21234 | PF01048 |       |       | K01244 |           |
| Oryza sativa     | 8     | 26507180 | 26512566 | LOC_Os08g41950               | OsMADS7 - MADS-box family gene with MIKCc type-box                         | PTHR11945 | PF00319 | PF01486 |       | KOG2104|           |
| Zea mays         | 1     | 194243577  | 194252745 | GRMZM2G171111               | methylthionucleosidase 1                                                   | PTHR21234 | PF01048 |       |       | K01244 |           |
| Sorghum bicolor  | 7     | 61349792 | 61357683 | Sobic.007G193300             | similar to putative MADS-domain transcription factor                       | PTHR11945 | PF00319 | PF01486 |       | KOG2104|           |
| Oryza sativa     | 8     | 26501167 | 26506218 | LOC_Os08g41940               | OsSPL16 - SBP-box gene family member                                        | PTHR11945 | PF00319 | PF01486 |       | KOG2104|           |
| Sorghum bicolor  | 7     | 61367404 | 61373899 | Sobic.007G193500             | similar to Teosinte glume architecture 1                                   | PTHR21234 | PF01048 |       |       | K01244 |           |
| Oryza sativa     | 8     | 26511667 | 26506218 | LOC_Os08g41940               | OsSPL16 - SBP-box gene family member                                        | PTHR21234 | PF01048 |       |       | K01244 |           |

**BAC begin**

| number | BAC begin | end | Genome | chrom | begin | end | locus | description |
|--------|-----------|-----|--------|-------|-------|-----|-------|-------------|
| 4567   | 6679      |     | Sorghum bicolor | 7     | 61256609 | 61258339 | SHCRBu_044_D02.1 | glycosylphosphatidylinositol |
| 9728   | 15016     |     | Sorghum bicolor | 7     | 61256609 | 61258339 | SHCRBu_044_D02.1 | glycosylphosphatidylinositol |
| 15181  | 18458     |     | Sorghum bicolor | 7     | 61251598 | 61254964 | SHCRBu_044_D02.4 | emp24gp25Lp24_familyGOLD_family |
| BAC end | location | Genome | chrom | location | locus | description | PANTHER | PFAM | PFAM | PFAM | KOG | KEGGORTH |
|---------|----------|--------|-------|----------|-------|-------------|---------|-------|-------|-------|-----|-----------|
| 3' to BAC | 61949017 | 61203156 | Oryza sativa | 8 | 26609538 | LOC_Os08g42110 | expressed protein | PTHR13050 | PF09753 | PF09753 | PF09753 | KOG1613 | K2586 |
| 3' to BAC | 61194017 | 61203156 | Sorghum bicolor | 7 | 61194017 | Sobic.007G19160 | similar to Os11g0311300 | PTHR11897 | PF01138 | PF03725 | KO2586 | KO2 | KO1613 |
| 3' to BAC | 61202234 | 61206647 | Sorghum bicolor | 7 | 61202234 | Sobic.007G191700 | similar to Cation exchanger-like | PTHR9753 | | | | | |
### Supplementary Table S3.xlsx

| BAC | Grass Genomes | description | PANTHER | PFAM | PFAM | PFAM | KOG | KEGGORTH |
|-----|---------------|-------------|---------|------|------|------|-----|----------|
|     | number | location | Genome | chrom | begin | end | locus | GRMZM5G886044 | 3'-5'-exoribonuclease family | PTHR11097 | PF1138 | PF03725 | KOG1613 | K12586 |
|     | 1 | 194789367 | Zea mays | 1 | 194798364 | Sobic.007G191500 | hypothetical |
|     | 1 | 194965843 | Zea mays | 1 | 194968109 | Sobic.007G191200 | similar to Disease resistant allele XA13 |
|     | 7 | 61142906 | Sorghum bicolor | 7 | 61139146 | LOC_Os08g42380 | mitochondrial import inner membrane translocase expressed |
|     | 8 | 26749936 | Oryza sativa | 8 | 26751370 | LOC_Os08g42390 | glycerophosphoryl diester phosphodiesterase family expressed |
|     | 7 | 61132957 | Sorghum bicolor | 7 | 61139146 | LOC_Os08g42380 | mitochondrial import inner membrane translocase expressed |
|     | 8 | 26751370 | Oryza sativa | 8 | 26751370 | LOC_Os08g42390 | glycerophosphoryl diester phosphodiesterase family expressed |
**Supplementary Table S3. Genomic neighbourhood of scIvana elements.** The three BACs with the scIvana elements, SCHRBa_044_D02 (scIvana1.2), SCHRBa_011_K15 (scIvana1.1) SCHRBa_015_D15 (scIvana1.4) were masked and then screened against three grass genomes *S. bicolor* (v2.1), *Z. mays* (v6a) and *O. sativa* (v7.0). Genes were identified in the BACs and the three grass genomes. To identify putative genes in the sugarcane genome close to the BAC, genes in *S. bicolor*, *Z. mays* and *O. sativa* were identified in the regions 100kb 5' and 3' to the BAC. Supplementary Table S3 shows the locus, description, chromosome, location of each gene and the functional annotation from the Panther, PFAM and KEGG databases (Kanehisa and Goto, 2000; Punta et al., 2012; Mi et al., 2013).

| Genome  | chrom | begin | end   | locus                     | description                                           | PANTHER   | PFAM | KOG | KEGGORTH |
|---------|-------|-------|-------|--------------------------|-------------------------------------------------------|------------|------|-----|----------|
| *Zea mays* | 1     | 195179488 | 195184434 | GRMZM2G0644962           | PLC-like phosphodiesterase superfamily               | PTHR22958 | PF03009 |     | KOG2421  |
| *Sorghum bicolor* | 7     | 61116847 | 61120167 | Sobic.007G190500         | hypothetical                                          |            |      |     |          |
| *Oryza sativa*    | 8     | 26766816 | 26770345 | LOC_Os08g42400           | no apical meristem protein putative expressed         | PF02365   |      |     |          |
| *Zea mays*       | 1     | 195218120 | 19521530 | GRMZM2G054252            | BAC domain/source                                    | PF02365   |      |     |          |
| *Zea mays*       | 1     | 195217815 | 195219618 | GRMZM2G054383            | hypothetical                                          |            |      |     |          |
| *Sorghum bicolor* | 7     | 61091240 | 61096923 | Sobic.007G190400         | hypothetical                                          | PF10536   |      |     |          |
| *Sorghum bicolor* | 7     | 61084921 | 61089051 | Sobic.007G190300         | hypothetical                                          |            |      |     |          |
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