**Supplementary Material**

Table S1 The variation in origin, electrical conductivity and pH of the soil samples.

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| --- | --- | --- | --- | --- |
| **Zone of soil sample collection** | **Soil sample number** | **Province / Area**  | **Electrical conductivity (mS/m)** | **pH** |
| 1. Coastal  (9) | 1234567825 | Western CapeWestern CapeWestern CapeKwaZulu NatalKwaZulu NatalKwaZulu NatalKwaZulu NatalKwaZulu NatalEastern Cape | 212.080.137.477.632.699.171.664.818.0 | 7.17.37.66.86.96.46.66.77.8 |
| 2. Middle interior  (11) | 1920212223242627282930 | Free StateFree StateFree StateNorthern CapeNorthern CapeNorthern CapeNorth WestNorth WestNorth WestNorth WestNorth West | 22.156.333.817.917.350.384.854.542.861.872.7 | 6.56.07.07.57.47.17.07.27.26.26.2 |
| 3. Northern interior (20) | 910111213141516171831323334353637383940 | GautengGautengGautengGautengGautengGautengMpumalangaMpumalangaMpumalangaMpumalangaLimpopoLimpopoLimpopoLimpopoLimpopoLimpopoLimpopoLimpopoLimpopoLimpopo | 148.672.845.9193.737.597.849.336.7101.197.5106.4188.4100.127.647.266.726.5139.057.519.8 | 6.56.86.96.67.67.86.56.57.56.66.26.86.46.97.67.26.26.46.97.1 |

Table S2 Identity of pigeonpea genotypes that were used for trapping rhizobial strains from soil samples.

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| **Code of genotype in study** | **Full local name of genotype**  | **Descriptive notes** |
| Gen-1 | Mpuma-Red | Local; unimproved long-duration landrace; red seed |
| Gen-2 | Mpuma-Brn | Local; unimproved long-duration landrace; brown seed |
| Gen-3  | Ex-PP-MD-311  | Exotic; improved experimental medium duration cultivar; cream (white) seed  |
| Gen-4 | Mpuma-B-Spot | Local; unimproved long-duration landrace; black seed |
| Gen-5 | Ex-PP-MD-321 | Exotic; improved experimental medium duration cultivar; cream (white) seed |

Table S3 The performance of the best five soil samples in the various nodulation traits. [NN = number of nodules per plant; NFW = nodule fresh weight (g) per plant; RFW = root fresh weight (g) per plant nodule; SFW = shoot fresh weight (g) per plant; NDW = nodule dry weight (g) per plant; RDW = root dry weight (g) per plant; SDW = shoot dry weight (g) per plant; SSN = soil sample number].

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SSN | **NN** | SSN | **SFW** | SSN | **RFW** | SSN | **NFW** | SSN | **SDW** | SSN | **RDW** | SSN | **NDW** |
| *10* | 23.27 | *6* | 2.63 | ***33*** | 2.34 | *10* | 1.39 | ***33*** | 0.77 | ***33*** | 0.31 | *10* | 0.12 |
| ***33*** | 21.93 | ***33*** | 2.59 | *4* | 2.00 | *5* | 1.33 | *32* | 0.66 | *7* | 0.26 | ***33*** | 0.10 |
| *16* | 18.27 | *16* | 2.50 | *6* | 1.95 | ***33*** | 1.18 | *6* | 0.64 | *6* | 0.26 | *32* | 0.08 |
| *32* | 16.07 | *32* | 2.38 | *26* | 1.91 | *16* | 1.13 | *16* | 0.63 | *10* | 0.23 | *16* | 0.08 |
| *17* | 11.64 | *30* | 2.29 | *39* | 1.90 | *37* | 1.05 | *8* | 0.59 | *39* | 0.22 | *6* | 0.08 |
| Control | 0.00  |   | 0.90  |   | 1.40 |   | 0.00 |   | 0.20 |   | 0.13 |   | 0.00 |
| LSD(0.05) | 3.38 |   | 0.49 |   | 0.58 |   | 0.36 |   | 0.14 |   | 0.08 |   | 0.02 |