**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) | 1  2  3  4  5  6  7  8  25 | Western Cape  Western Cape  Western Cape  KwaZulu Natal  KwaZulu Natal  KwaZulu Natal  KwaZulu Natal  KwaZulu Natal  Eastern Cape | 212.0  80.1  37.4  77.6  32.6  99.1  71.6  64.8  18.0 | 7.1  7.3  7.6  6.8  6.9  6.4  6.6  6.7  7.8 |
| 2. Middle interior  (11) | 19  20  21  22  23  24  26  27  28  29  30 | Free State  Free State  Free State  Northern Cape  Northern Cape  Northern Cape  North West  North West  North West  North West  North West | 22.1  56.3  33.8  17.9  17.3  50.3  84.8  54.5  42.8  61.8  72.7 | 6.5  6.0  7.0  7.5  7.4  7.1  7.0  7.2  7.2  6.2  6.2 |
| 3. Northern interior  (20) | 9  10  11  12  13  14  15  16  17  18  31  32  33  34  35  36  37  38  39  40 | Gauteng  Gauteng  Gauteng  Gauteng  Gauteng  Gauteng  Mpumalanga  Mpumalanga  Mpumalanga  Mpumalanga  Limpopo  Limpopo  Limpopo  Limpopo  Limpopo  Limpopo  Limpopo  Limpopo  Limpopo  Limpopo | 148.6  72.8  45.9  193.7  37.5  97.8  49.3  36.7  101.1  97.5  106.4  188.4  100.1  27.6  47.2  66.7  26.5  139.0  57.5  19.8 | 6.5  6.8  6.9  6.6  7.6  7.8  6.5  6.5  7.5  6.6  6.2  6.8  6.4  6.9  7.6  7.2  6.2  6.4  6.9  7.1 |

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 |