**Table S3** Changes of 28 alfalfa cultivars under medium nitrogen level (N210) in seedling stage

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **NO.** | **Cultivars** | **SDW****(g•plant -1)** | **RDW****(g•plant -1)** | **PDW****(g•plant -1)** | **SH****(cm)** | **RL****(cm•plant -1)** | **RV****(cm3)** | **SNC****(%)** | **RNC****(%)** | **PNC****(%)** | **SNA****(mg•plant -1)** | **RNA****(mg•plant -1)** | **PNA****(mg•plant -1)** |
| 1 | Gannong NO.3 | 2.23±0.22e | 0.24±0.01c | 2.47±0.21defg | 15.17±0.21g | 90.13±18.66abc | 0.08±0.02abcd | 2.14±0.02o | 2.78±0.05ij | 2.21±0.02mm | 4.78±0.48ghi | 0.67±0.03fg | 5.44±0.47ijk |
| 2 | Gannong NO.4 | 2.19±0.09e | 0.14±0.02ijk | 2.33±0.09g | 15.90±0.15ef | 71.79±9.69bcdef | 0.04±0.01hi | 2.96±0.15gh | 3.49±0.01c | 2.99±0.14gh | 6.49±0.26de | 0.48±0.05jklm | 6.97±0.27fg |
| 3 | Gannong NO.5 | 2.25±0.07e | 0.20±0.00def | 2.44±0.07efg | 17.68±0.15b | 75.13±5.71abcde | 0.08±0.01ab | 3.36±0.04bc | 3.1±0.07gh | 3.34±0.03cd | 7.54±0.23c | 0.61±0.01g | 8.15±0.23c |
| 4 | Gannong NO.7 | 1.34±0.03k | 0.19±0.00efg | 1.53±0.04n | 14.82±0.15h | 78.25±11.62abcde | 0.06±0.01bcdefgh | 3.25±0.04cd | 3.24±0.02e | 3.25±0.03de | 4.36±0.11i | 0.61±0.01g | 4.96±0.12k |
| 5 | Gannong NO.8 | 1.15±0.09l | 0.2±0.01def | 1.35±0.09p | 14.80±0.15h | 80.14±8.15abcd | 0.05±0.01efghi | 2.28±0.08mn | 3.45±0.02c | 2.45±0.08l | 2.62±0.21l | 0.68±0.03fg | 3.30±0.22m |
| 6 | Gannong NO.9 | 1.43±0.03k | 0.19±0.00efg | 1.62±0.03mn | 13.72±0.15g | 98.97±8.79a | 0.06±0.01bcdefgh | 3.19±0.02de | 3.3±0.01d | 3.20±0.02e | 4.57±0.11hi | 0.62±0.01g | 5.19±0.10jk |
| 7 | Longdong | 1.72±0.04hij | 0.15±0.02hi | 1.88±0.03ijk | 13.38±0.15k | 30.11±0.96g | 0.02±0.00i | 2.12±0.02o | 2.64±0.02k | 2.17±0.02n | 3.66±0.08j | 0.41±0.05lmno | 4.07±0.07l |
| 8 | Xinjiangdaye | 2.42±0.03bcd | 0.17±0.02gh | 2.59±0.03cde | 15.65±0.21f | 79.93±21.04abcd | 0.09±0.04a | 2.80±0.05jk | 3.15±0.01fg | 2.82±0.04jk | 6.78±0.08d | 0.53±0.06ij | 7.31±0.07ef |
| 9 | Xinmu NO. 1 | 2.53±0.09bcd | 0.22±0.01def | 2.75±0.1b | 17.35±0.21c | 61.64±7.03def | 0.05±0.00defghi | 2.48±0.02l | 3.44±0.06c | 2.55±0.02l | 6.27±0.21ef | 0.75±0.04def | 7.02±0.25fg |
| 10 | Longmu 806 | 2.25±0.09e | 0.12±0.00jkl | 2.37±0.09fg | 15.98±0.21e | 54.67±14.04ef | 0.06±0.02bcdefgh | 3.36±0.03bc | 3.59±0.00b | 3.37±0.03bc | 7.56±0.30c | 0.44±0.01klmn | 8.00±0.29cd |
| 11 | Longmu 801 | 1.84±0.09fgh | 0.12±0.01kl | 1.96±0.09ij | 16.35±0.21d | 64.07±14.23def | 0.06±0.01abcdefgh | 2.84±0.07hijk | 3.33±0.03d | 2.87±0.07ij | 5.23±0.25g | 0.38±0.04no | 5.61±0.27ij |
| 12 | Gongnong NO.1 | 1.66±0.03ij | 0.14±0.01ijk | 1.8±0.04jkl | 12.58±0.15m | 81.77±22.32abcd | 0.07±0.03abcde | 2.87±0.04hij | 3.69±0.01a | 2.93±0.04hij | 4.77±0.10ghi | 0.50±0.03ijk | 5.27±0.12ijk |
| 13 | Gongnong NO.3 | 0.97±0.09m | 0.13±0.00jkl | 1.09±0.09p | 14.72±0.15h | 66.61±18.22cdef | 0.05±0.02defghi | 2.82±0.03ijk | 2.82±0.05i | 2.82±0.02jk | 2.73±0.24l | 0.35±0.01o | 3.08±0.24m |
| 14 | Zhaodong | 2.33±0.04cde | 0.24±0.00c | 2.57±0.04cde | 15.00±0.15gh | 77.53±7.73abcde | 0.05±0.01cdefgh | 2.96±0.11gh | 3.30±0.01d | 2.99±0.10gh | 6.90±0.11d | 0.80±0.01de | 7.70±0.11de |
| 15 | LW6010 | 2.84±0.07a | 0.46±0.02a | 3.30±0.05a | 18.10±0.21a | 70.37±6.99bcdef | 0.05±0.01efghi | 3.44±0.03b | 3.65±0.04a | 3.47±0.03ab | 9.77±0.23a | 1.69±0.07a | 11.46±0.17a |
| 16 | Reindeer | 1.66±0.09ij | 0.11±0.00kl | 1.78±0.09kl | 16.48±0.21d | 61.87±11.34def | 0.06±0.02bcdefgh | 3.11±0.05ef | 3.55±0.04b | 3.14±0.05ef | 5.16±0.27g | 0.41±0.01mno | 5.57±0.27ij |
| 17 | Crown | 2.46±0.16bc | 0.25±0.00c | 2.72±0.16bc | 15.90±0.15ef | 95.01±7.23ab | 0.06±0.00abcdefgh | 3.24±0.01d | 3.23±0.04e | 3.24±0.01de | 7.98±0.52bc | 0.82±0.01d | 8.80±0.53b |
| 18 | Goldqueen | 1.97±0.06f | 0.15±0.01hij | 2.12±0.07h | 16.48±0.21d | 61.68±14.92def | 0.06±0.02bcdefgh | 3.03±0.05fg | 3.33±0.03d | 3.05±0.05fg | 5.99±0.19f | 0.49±0.05ijkl | 6.48±0.22h |
| 19 | Giant 551 | 1.91±0.04fg | 0.11±0.00l | 2.02±0.04hi | 14.70±0.15h | 54.71±7.21ef | 0.04±0.01fghi | 2.72±0.04k | 3.10±0.01gh | 2.74±0.04k | 5.21±0.10g | 0.33±0.01o | 5.55±0.10ij |
| 20 | Giant 601 | 2.31±0.17cde | 0.19±0.00fg | 2.50±0.17def | 17.17±0.21c | 78.64±16.63abcde | 0.07±0.01abcdef | 3.57±0.03a | 3.69±0.01a | 3.57±0.03a | 8.25±0.61b | 0.68±0.01fg | 8.93±0.62b |
| 21 | Giant 6 | 1.62±0.09ij | 0.21±0.01def | 1.83±0.09jkl | 15.67±0.15ef | 62.05±3.52def | 0.04±0.01ghi | 2.93±0.04ghi | 2.74±0.01j | 2.91±0.04hij | 4.75±0.27ghi | 0.57±0.02hi | 5.32±0.26ijk |
| 22 | Giant 2 | 2.26±0.09de | 0.35±0.05b | 2.61±0.08bcd | 14.35±0.21i | 69.97±0.63cdef | 0.07±0.02abcdefg | 3.37±0.02b | 3.56±0.04b | 3.39±0.02bc | 7.62±0.29c | 1.24±0.16b | 8.86±0.26b |
| 23 | Sadie 7 | 0.57±0.03n | 0.21±0.01de | 0.78±0.04q | 12.3±0.15m | 75.68±14.86abcde | 0.07±0.01abcdefgh | 2.45±0.02l | 3.47±0.01c | 2.72±0.03k | 1.39±0.08m | 0.73±0.02ef | 2.12±0.10n |
| 24 | Sadie 10 | 1.95±0.09f | 0.16±0.00gh | 2.11±0.09h | 14.27±0.15i | 62.53±7.97def | 0.04±0.01ghi | 3.16±0.03de | 3.05±0.03h | 3.15±0.03ef | 6.17±0.27ef | 0.50±0.01ijk | 6.67±0.27gh |
| 25 | Tourists | 0.64±0.04n | 0.17±0.01gh | 0.81±0.04q | 15.98±0.21e | 50.14±13.40fg | 0.07±0.01abcdef | 2.19±0.02no | 2.65±0.02k | 2.28±0.01mm | 1.40±0.08m | 0.45±0.02jklmn | 1.85±0.10n |
| 26 | Elite | 1.59±0.03j | 0.13±0.00jkl | 1.71±0.03lm | 13.03±0.15l | 75.58±2.32abcde | 0.07±0.01abcde | 3.14±0.17def | 3.23±0.04e | 3.15±0.16ef | 4.99±0.11gh | 0.40±0.01mno | 5.39±0.10ijk |
| 27 | Weston | 1.35±0.09k | 0.33±0.02b | 1.68±0.1lm | 13.03±0.21l | 71.56±17.20bcdef | 0.08±0.02abc | 2.38±0.01lm | 3.18±0.02ef | 2.54±0.01l | 3.22±0.21k | 1.06±0.06c | 4.28±0.27l |
| 28 | Algonquin | 1.78±0.09ghi | 0.15±0.01hi | 1.93±0.09ijk | 16.47±0.15d | 77.90±16.46abcde | 0.05±0.02cdefgh | 2.94±0.17ghi | 3.15±0.05fg | 2.95±0.16ghi | 5.22±0.25g | 0.47±0.03jklm | 5.69±0.28i |

Note: SDW, RDW, PDW, SH, RL, RV, SNC, RNC, PNC, SNA, RNA and PNA respective shoot dry weight, root dry weight, plant dry weight, plant height, total root length, total root volume, shoot nitrogen content, root nitrogen content, plant nitrogen content, shoot nitrogen accumulation, root nitrogen accumulation and plant nitrogen accumulation.