**S1. Description of the scale used to score for drought tolerance in cowpea.**

|  |  |  |
| --- | --- | --- |
| **Score** | **Level of tolerance / susceptibility** | **Description** |
| 1 | Highly tolerant of drought | Excellent growth, excellent vigour, both trifoliate and unifoliolate leaves remain normal, no indication of willing. |
| 2 | Tolerant of drought | Very good growth, very high vigour, normal trifoliate and unifoliolate leaves no indication of wilting. |
| 3 | Moderately tolerant of drought | Good growth, high vigour, trifoliate and unifoliolate leaves no indication of wilting. |
| 4 | Slightly tolerant of drought. | Moderate vigour, unifoliolate leaves turn yellow, very slight wilting of trifoliate leaves. |
| 5 | Intermediate/Moderate reaction to Drought | Fair vigour, slight wilting of unifoliolate leaves; very slight wilting of trifoliate leaves. |
| 6 | Slightly susceptible to drought | Poor vigour, moderate wilting of trifoliate leaves, deeper yellow colour of unifoliolate leaves becomes deeper with severe wilting. |
| 7 | Moderately susceptible to drought | Very poor vigour, more severe wilting leaves which are of reduced size; the unifoliolate leaves start to drop. |
| 8 | Susceptible to drought | Very severe wilting and drying up of the whole plant but turgidity of the growing tips due to mobility of moisture from the unifoliolate leaves. |
| 9 | Highly susceptible to drought | Seedling completely dried up; plant dead. |

**S 2. Combined Analysis of variance of some seedling traits in two cowpea crosses under three water regimes 0DWS, 10DWS and 15DWS) in the screenhouse.**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Danilla× IT97K-499-35** | | | | | | |
| **Source of variation** | **df** | **Water Regime** | **Seedling Height** | **Seedling Vigour** | **Seedling leaf area** | **Recovery capacity** |
| Treatments |  | 0DWS | 410.1\* | 0.0 | 84.0 | - |
|  |  | 10DWS | 34.2\* | 0.0 | 35.9 | - |
|  |  | 15DWS | 24.0\* | 0.1 | 72.9 | 597.7\* |
|  | 5 | Pool Treat. | 256.4\* | 0.02 | 131.1\* | - |
| Error |  | 0DWS | 7.2 | 0.0 | 32.3 | - |
|  |  | 10DWS | 3.7 | 0.0 | 11.9 | - |
|  |  | 15DWS | 2.4 | 0.1 | 23.9 | 54.53 |
|  |  | Pool Error | 4.1 | 0.02 | 21.3 |  |
| Water Regime | 2 |  | 381.9\* | 19.0 | 852.6\* |  |
| Treat.\*Water Re. | 10 |  | 106.0\* | 0.02 | 30.9 |  |
|  |  |  |  |  |  |  |
| **Danilla×Tvu7778** | | | | | | |
| **Source of variation** | **df** | **Water Regime** | **Seedling Height** | **Seedling Vigour** | **Seedling leaf area** | **Recovery capacity** |
| Treatments | 5 | 0DWS | 193.6\* | 0.0 | 77.7\* | - |
|  |  | 10DWS | 24.5\* | 0.7\* | 27.0\* | - |
|  |  | 15DWS | 22.4\* | 2.2\* | 58.1\* | 3471.43 |
|  |  | Pool Treat. | 175.4\* | 1.2\* | 117.1\* | - |
| Error | 10 | 0DWS | 35.6 | 0.0 | 19.8 | - |
|  |  | 10DWS | 3.9 | 0.1 | 6.9 | - |
|  |  | 15DWS | 4.1 | 0.2 | 6.0 | 14.29 |
|  |  | Pool Error | 13.4 | 0.1S | 16.4 | - |
| Water Regime | 2 |  | 1049.9\* | 179.3\* | 1684.7\* | - |
| Treat.\*Water Re. | 10 |  | 32.5\* | 0.9\* | 22.9 | - |
| \*=Significant, | P≤0.05. |  |  |  |  |  |

**S3. Relative Performance of ten cowpea genotypes to water stress at**

**different days (% wilting, D5-D30) after withdraw of water.**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Cowpea Vareity** | **Parent** | **D5** | **D10** | **D15** | **D20** | **D25** | **D30** | **% Recovery.** |
| Danilla | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 100 |
| IT92KD-357-3 | 2 | 0 | 0 | 0 | 0 | 100 | 100 | 0 |
| TVU7778 | 3 | 0 | 0 | 0 | 100 | 100 | 100 | 0 |
| TVU12349 | 4 | 0 | 0 | 0 | 0 | 100 | 100 | 0 |
| IT93K-452-1 | 5 | 0 | 0 | 0 | 0 | 0 | 100 | 40 |
| IT97K-499-35 | 6 | 0 | 0 | 0 | 0 | 0 | 100 | 80 |
| IT89KD-288 | 7 | 0 | 0 | 0 | 0 | 100 | 100 | 0 |
| IT98K-205-8 | 8 | 0 | 0 | 0 | 100 | 100 | 100 | 0 |
| IT98K-491-4 | 9 | 0 | 0 | 0 | 100 | 100 | 100 | 0 |
| IT99K-513-21 | 10 | 0 | 0 | 0 | 0 | 100 | 100 | 60 |