Supplemental Table 1. Description of the scale used to score winter survival of the switchgrass.

|  |  |
| --- | --- |
| Scale | Description |
| 0 | Fully dead |
| 1 | Only one green tiller emerging from the crown |
| 2 | Two green tillers emerging from the crown |
| 3 | Three to five green tillers emerging from the crown |
| 5 | Approximately 25% of the tiller regrowth from the crown |
| 8 | Percentage of the tiller regrowth > 25% and < 50% |
| 10  | Approximately 50% of the tiller regrowth |
| 12 | Percentage of the tiller regrowth > 50% and < 75% |
| 15 | Approximately 75% of the tiller regrowth |
| 18 | About full recovery but with slight less vigor or small patch without green tiller in the crown |
| 20 | Full recovery (100%) |

Supplemental Table 2. Passport data for switchgrass populations that comprised Validation data set #1, VDS #1 (Min Temp = 30-yr normal minimum temperature at the site of origin of the population).

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Population name | State of origin | Population group †  | Individuals (n) | Min Temp‡ | Latitude | Longitude |
|  |  |  |  |  | oN | oW |
| Big Branch | LA | LC | 5 | 4.3 | 30.27 | 89.96 |
| Biloxi | MS | LC | 5 | 3.5 | 30.78 | 88.76 |
| Biloxi1 | MS | LC | 3 | 3.8 | 30.73 | 88.78 |
| Biloxi2 | MS | LC | 2 | 3.7 | 30.75 | 88.78 |
| Fort Polk | LA | LC | 5 | 2.4 | 30.97 | 93.17 |
| Grand Bay | MS | LC | 5 | 5.0 | 30.45 | 88.66 |
| Greenville | AL | LC | 5 | 1.3 | 31.62 | 86.53 |
| Intracoastal | LA | LC | 3 | 5.0 | 29.80 | 92.14 |
| Kisatchie | LA | LC | 5 | 2.4 | 31.01 | 93.04 |
| PMT785 (PI 422003) | TX | LC | 10 | 4.3 | 29.44 | 96.94 |
| Pitkin | LA | LC | 5 | 2.4 | 30.95 | 93.16 |
| Sabine | LA | LC | 5 | 2.2 | 30.84 | 93.57 |
| Wolf Bay | AL | LC | 4 | 5.6 | 30.35 | 87.62 |
| High Tide | MD | LN | 7 | 5.4 | 39.61 | 76.15 |
| BN1135763 (PI 315727) | NC | LN | 13 | 1.8 | 35.73 | 78.85 |
| SW793 | NY | LN | 1 | 5.4 | 40.52 | 74.22 |
| SW795 | NY | LN | 2 | 4.7 | 40.61 | 74.08 |
| SW796 | NY | LN | 3 | 5.1 | 40.62 | 74.18 |
| SW802 | NY | LN | 1 | 4.0 | 40.72 | 73.58 |
| SW803 | NY | LN | 2 | 5.2 | 41.04 | 71.93 |
| SW805 | NY | LN | 1 | 5.2 | 41.02 | 72.01 |
| MS155 (PI 421999) | AR | LS | 19 | 3.4 | 35.43 | 91.84 |
| Blair | OK | LS | 5 | 4.2 | 34.84 | 99.37 |
| BN.12323.69 (PI 414070) | KS | LS | 17 | 9.3 | 38.81 | 98.27 |
| BN.14668.65 (PI 410065) | AR | LS | 16 | 3.4 | 35.43 | 91.84 |
| Brookville | MS | LS | 4 | 0.1 | 33.20 | 88.57 |
| HSP | FL | LS | 11 | 9.3 | 28.14 | 82.22 |
| Lake ET | OK | LS | 5 | 3.5 | 34.73 | 98.52 |
| LBJ | TX | LS | 5 | 1.2 | 33.41 | 97.67 |
| Lueders | TX | LS | 5 | 0.5 | 32.75 | 99.62 |
| Mineral Wells | TX | LS | 5 | 0.4 | 32.80 | 98.19 |
| P33 | TX | LS | 5 | 1.7 | 32.72 | 98.67 |
| Kanlow | OK | LS | 14 | 3.0 | 35.26 | 96.18 |
| Stuart | FL | LS | 3 | 12.0 | 27.20 | 80.25 |
| Alamo | TX | LS | 8 | 5.4 | 28.33 | 98.12 |
| Possum Kingdom | TX | LS | 5 | 1.9 | 32.88 | 98.57 |
| Reydon | OK | LS | 6 | 5.4 | 35.65 | 99.93 |
| Roby | TX | LS | 5 | 1.3 | 32.76 | 100.31 |
| Roswell | NM | LS | 3 | 5.8 | 33.62 | 104.37 |
| SNF | SC | LS | 14 | 1.0 | 34.53 | 81.63 |
| SW789 | MS | LS | 1 | 3.5 | 33.45 | 88.79 |
| SWFWMD | FL | LS | 3 | 9.0 | 27.90 | 81.59 |
| Timber | NC | LS | 3 | 3.2 | 35.78 | 78.68 |

† Population groups based on Evans et al. (2017): LC = Lowland Central, LS = Lowland South, LN = Lowland North.

‡ 30-years normal minimum temperature of the coldest month (http://www. worldclim.org/)

Supplemental Table 3. Passport data for switchgrass populations that comprised Validation data set #2 (VDS #2).

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Population name | Population origin | Known ploidy † | Latitude‡ | Longitude‡ | Number of Individuals  |
|  |  |  | oN | oW |  |
| WALS\_101 | Bellamy, AL |  | 32.43 | 88.02 | 8 |
| WALS\_102 | Cuba, AL | 8X | 32.44 | 88.35 | 8 |
| WALS\_103 | West point, GA | 8X | 32.91 | 85.02 | 8 |
| WALS\_106 | Lacombe, LA | 4X | 30.27 | 89.96 | 6 |
| WALS\_109 | Biloxi, MS |  | 30.78 | 88.76 | 8 |
| WALS\_110 | Jackson, MS |  | 32.29 | 90.23 | 8 |
| WALS\_113 | Boomer lake, OK |  | 36.15 | 97.07 | 8 |
| WALS\_115 | Manchester, TN |  | 35.53 | 86.01 | 8 |
| SW\_1641 | Madison, WI | 4X | NA | NA | 7 |
| SW\_2236 | Madison, WI |  | NA | NA | 8 |
| SW\_6\_2013 | Starkville, MS |  | NA | NA | 7 |
| ACC\_J249.BF.K | Colton, TX | 4X | 30.15 | 97.69 | 7 |
| ACC\_J250.BF.K | Cypress Mill, TX | 4X | 30.33 | 98.12 | 7 |
| ACC\_J251.BF.K | Austin, TX |  | 30.29 | 97.74 | 8 |
| ACC\_J268.BF.K | Coahuila, Mexico |  | 29.32 | 101.36 | 8 |
| SW\_20\_101 | Florence, KS |  | 38.23 | 96.93 | 8 |
| SW\_28\_102 | San Angelo, TX |  | 31.37 | 101.50 | 8 |
| SW\_28\_104 | Twin Buttes Reservoir, TX | 4X | 31.37 | 100.52 | 8 |
| SW\_28\_106 | Twin Buttes Reservoir, TX | 4X | 31.35 | 100.52 | 8 |
| SW\_28\_109 | Twin Buttes Reservoir, TX | 4X | 31.35 | 100.52 | 8 |
| SW\_28\_110 | Devils River, Juno, TX | 4X | 29.95 | 101.13 | 8 |
| SW\_28\_111 | Devils River, Juno, TX |  | 29.95 | 101.13 | 8 |
| ACC\_J279 | Coahuila, Mexico | 4X | 29.32 | 101.36 | 8 |

† Ploidy determined based on flow cytometry evaluation (Evans et al., 2017; Grabowski et al., 2017).

‡ NA = not available, because no specific latitude or longitude value can be assigned to the three breeding populations, which all have diverse origins.