# Breeding and Development of Bentgrass

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## Goals:

- Develop stress tolerant bentgrass cultivars with specific emphasis on heat tolerance, root growth characters, turf quality, and resistance to natural disease and insect pests.

- Continue genetic studies involving heritability and stability of biological traits associated with stress tolerance.

CRENSHAW and CATO were released in April 1993. Considerable success has been realized in the performance and utility of both grasses, especially throughout the southern United States. CATO was licensed to Pickseed West, Tangent, Oregon and was commercially available in the fall of 1994. CRENSHAW was licensed to Lofts Seed, Inc., Somerset, New Jersey and was available commercially with limited supplies in 1993. The demand for CRENSHAW increased steadily in 1994, and regardless of increased production, seed was sold out for the year.

Syn1-88 is a re-selection from Seaside, and Pickseed West will have seed available commercially in 1995. Syn1-88 is recognized for its low maintenance requirements and excellent salt tolerance. Syn1-88 is being evaluated extensively in California and West Texas for salinity tolerance under golf course conditions.

Burlingham & Sons have negotiated an option agreement with Texas A&M for the testing and evaluation rights on Syn92-1 and Syn92-5 creeping bentgrasses. Four elite bentgrasses lines were increased in 1993, and three of them were entered into the 1993 NTEP bentgrass trials. These new varieties were developed specifically for improvements in heat tolerance, deep root growth characters, disease resistance, persistence, and competitive ability.

Progeny of advanced lines were selected from Oregon production fields and will be included in tests to evaluate total plant performance at TAES-Dallas, including vegetative growth characters, turf quality, disease resistance, insect resistance, traffic and salinity tolerance, heat tolerance, and root growth characters.

Mean Turfgrass Quality Ratings of Bentgrass Cultivars for Each Month Grown on a Fairway or Tee at Twenty-One Locations in the United States and Canada. 1994 Data.[2]

| | Turfgrass Quality Ratings 1 - 9; 9 = Ideal Turf: Months[1] | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **NAME** | **FEB** | **MAR** | **APR** | **MAY** | **JUN** | **JUL** | **AUG** | **SEP** | **OCT** | **NOV** | **DEC** | **MEAN** |
| PROVIDENCE | 5.3 | 5.8 | 6.1 | 6.6 | 6.7 | 6.6 | 6.6 | 7.1 | 7.0 | 6.5 | 6.7 | 6.7 |
| CATO | 4.0 | 4.9 | 6.3 | 6.4 | 6.8 | 6.8 | 6.6 | 7.0 | 6.9 | 5.8 | 6.0 | 6.6 |
| CRENSHAW | 2.3 | 5.3 | 6.2 | 6.4 | 6.9 | 6.9 | 6.6 | 6.8 | 6.5 | 5.7 | 6.0 | 6.6 |
| PENNEAGLE | 4.7 | 6.0 | 6.3 | 6.6 | 6.4 | 6.8 | 6.6 | 6.9 | 6.7 | 5.9 | 6.0 | 6.6 |
| SOUTHSHORE | 4.3 | 5.1 | 6.1 | 6.5 | 6.5 | 6.6 | 6.5 | 6.7 | 6.5 | 5.9 | 6.3 | 6.4 |
| G-6 | 2.7 | 5.0 | 5.9 | 6.1 | 6.3 | 6.5 | 6.4 | 6.9 | 6.8 | 6.0 | 6.8 | 6.4 |
| PRO/CUP | 3.3 | 5.6 | 6.0 | 6.4 | 6.4 | 6.4 | 6.3 | 6.4 | 6.2 | 6.3 | 6.3 | 6.3 |
| G-2 | 5.3 | 4.3 | 5.6 | 6.0 | 6.2 | 6.4 | 6.2 | 6.8 | 6.7 | 5.9 | 7.3 | 6.3 |
| PENNCROSS | 4.0 | 6.2 | 6.2 | 6.5 | 6.4 | 6.2 | 6.2 | 6.2 | 6.1 | 5.8 | 4.8 | 6.2 |
| BAR WS 42102 | 2.3 | 4.3 | 5.8 | 6.2 | 6.4 | 6.3 | 6.1 | 6.4 | 6.2 | 5.3 | 5.0 | 6.2 |
| TRUELINE | 4.0 | 4.8 | 5.5 | 5.9 | 6.2 | 6.3 | 6.3 | 6.5 | 6.2 | 5.8 | 5.8 | 6.1 |
| LOPEZ | 4.3 | 4.7 | 5.5 | 5.9 | 6.1 | 6.2 | 6.3 | 6.4 | 6.2 | 5.8 | 5.8 | 6.1 |
| 18TH GREEN | 2.7 | 4.7 | 5.7 | 6.1 | 6.2 | 6.4 | 6.3 | 6.2 | 5.9 | 5.1 | 3.3 | 6.1 |
| DF-1 | 5.0 | 5.3 | 5.7 | 5.8 | 5.9 | 6.2 | 6.0 | 6.5 | 6.2 | 6.0 | 6.0 | 6.1 |
| ISI-AT-90162 | 5.3 | 5.6 | 5.8 | 5.6 | 5.9 | 5.4 | 5.8 | 6.1 | 6.2 | 5.5 | 6.2 | 5.8 |
| SR 7100 | 6.0 | 5.7 | 6.1 | 5.9 | 6.2 | 5.6 | 5.7 | 5.8 | 5.9 | 5.9 | 4.7 | 5.8 |
| OM-AT-90163 | 4.0 | 5.4 | 6.1 | 5.8 | 5.7 | 5.2 | 5.6 | 5.8 | 5.9 | 5.4 | 5.8 | 5.7 |
| TENDENZ | 3.3 | 4.8 | 6.1 | 5.8 | 5.7 | 4.8 | 5.5 | 5.4 | 5.6 | 5.1 | 4.0 | 5.4 |
| BAR AS 492 | 6.0 | 4.4 | 4.8 | 5.4 | 5.2 | 5.1 | 5.5 | 5.9 | 5.6 | 6.1 | 6.2 | 5.4 |
| SEASIDE | 5.3 | 5.2 | 5.3 | 5.2 | 4.8 | 4.7 | 4.9 | 4.9 | 5.1 | 5.3 | 4.8 | 5.1 |
| EXETER | 5.0 | 5.8 | 5.1 | 4.9 | 4.5 | 4.4 | 4.6 | 4.9 | 5.0 | 4.9 | 4.8 | 4.8 |
| LSD VALUE | 0.9 | 1.0 | 0.8 | 0.6 | 0.5 | 0.6 | 0.5 | 0.5 | 0.5 | 1.0 | 1.1 | 0.4 |

[1] To determine statistical differences among entries, subtract one entry's mean from another entry's mean. Statistical differences occur when this value is larger than the corresponding LSD Value (LSD 0.05).

[2] Source: National Turfgrass Evaluation Program. National Bentgrass Test - 1993 (Fairways/Tee)

Mean Turfgrass Quality Ratings of Bentgrass Cultivars for Each Month Grown on a Green at Twenty-Six Locations in the United States. 1994 Data.[2]

| | Turfgrass Quality Ratings 1 - 9; 9 = Ideal Turf: Months[1] | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **NAME** | **JAN** | **FEB** | **MAR** | **APR** | **MAY** | **JUN** | **JUL** | **AUG** | **SEP** | **OCT** | **NOV** | **DEC** | **MEAN** |
| A-4 | 5.2 | 6.2 | 5.6 | 5.7 | 6.2 | 6.6 | 6.6 | 6.5 | 6.5 | 6.4 | 5.9 | 4.9 | 6.5 |
| L-93 | 3.8 | 5.2 | 5.3 | 5.1 | 5.8 | 6.1 | 6.4 | 6.6 | 6.7 | 6.6 | 5.8 | 4.5 | 6.4 |
| PROVIDENCE | 4.8 | 5.8 | 5.5 | 5.6 | 6.1 | 6.4 | 6.3 | 6.4 | 6.4 | 6.3 | 5.8 | 4.4 | 6.3 |
| A-1 | 5.0 | 5.4 | 5.4 | 5.3 | 5.9 | 6.1 | 6.4 | 6.4 | 6.6 | 6.5 | 5.9 | 4.8 | 6.3 |
| CRENSHAW | 5.7 | 5.4 | 5.6 | 5.3 | 6.1 | 6.1 | 6.4 | 6.5 | 6.2 | 6.1 | 5.5 | 3.9 | 6.2 |
| CATO | 4.8 | 5.0 | 5.3 | 5.3 | 6.1 | 6.3 | 6.4 | 6.3 | 6.2 | 6.2 | 5.7 | 4.4 | 6.2 |
| G-6 | 4.3 | 5.2 | 4.7 | 4.9 | 5.6 | 6.0 | 6.2 | 6.3 | 6.3 | 6.4 | 5.8 | 4.4 | 6.1 |
| G-2 | 4.2 | 4.7 | 4.8 | 4.9 | 5.6 | 5.9 | 6.0 | 6.2 | 6.4 | 6.4 | 5.8 | 5.0 | 6.1 |
| SOUTHSHORE | 5.0 | 5.9 | 5.4 | 5.4 | 5.8 | 6.1 | 6.1 | 6.2 | 6.3 | 5.9 | 5.5 | 4.4 | 6.1 |
| SYN 92-1 | 4.5 | 5.4 | 5.3 | 5.3 | 6.2 | 6.3 | 6.3 | 6.3 | 6.1 | 5.9 | 5.3 | 3.8 | 6.0 |
| SYN 92-5 | 4.3 | 6.1 | 5.2 | 5.5 | 5.9 | 6.0 | 6.1 | 5.9 | 6.1 | 6.0 | 5.3 | 4.2 | 6.0 |
| SYN 92-2 | 4.2 | 5.7 | 5.6 | 5.2 | 6.0 | 6.0 | 6.0 | 6.1 | 6.0 | 5.8 | 5.1 | 3.9 | 5.9 |
| SR 1020 | 5.2 | 5.1 | 5.3 | 5.2 | 5.8 | 5.9 | 6.0 | 6.0 | 5.9 | 5.9 | 5.6 | 4.4 | 5.9 |
| PENNLINKS | 4.0 | 4.8 | 5.3 | 5.4 | 5.7 | 5.8 | 5.8 | 5.9 | 6.0 | 5.9 | 5.3 | 4.1 | 5.8 |
| REGENT | 5.5 | 5.6 | 5.6 | 4.8 | 5.5 | 5.7 | 5.8 | 5.9 | 6.0 | 5.8 | 5.3 | 4.5 | 5.8 |
| BAR WS 42102 | 3.8 | 4.6 | 5.2 | 5.1 | 5.7 | 5.8 | 6.0 | 5.8 | 6.0 | 5.9 | 4.6 | 3.5 | 5.8 |
| MSUEB | 4.3 | 4.6 | 5.5 | 5.3 | 5.6 | 5.6 | 5.7 | 5.8 | 5.9 | 5.8 | 5.2 | 4.1 | 5.7 |
| ISI-AP-89150 | 4.3 | 5.2 | 4.8 | 5.0 | 5.7 | 5.6 | 5.6 | 5.8 | 5.9 | 5.8 | 5.3 | 3.8 | 5.7 |
| 18TH GREEN | 4.2 | 3.8 | 4.8 | 4.9 | 5.6 | 6.0 | 5.9 | 6.0 | 5.6 | 5.5 | 4.7 | 3.1 | 5.7 |
| LOPEZ | 3.5 | 4.4 | 4.6 | 4.9 | 5.1 | 5.4 | 5.8 | 5.9 | 5.9 | 5.9 | 5.1 | 4.2 | 5.6 |
| PRO/CUP | 4.5 | 5.0 | 5.3 | 4.9 | 5.6 | 5.6 | 5.5 | 5.8 | 5.7 | 5.7 | 4.8 | 3.8 | 5.6 |
| DG-P | 4.0 | 4.8 | 4.4 | 4.4 | 5.1 | 5.4 | 5.6 | 5.9 | 5.8 | 5.8 | 5.1 | 3.9 | 5.6 |
| PENNCROSS | 5.0 | 5.1 | 5.5 | 5.4 | 5.5 | 5.7 | 5.6 | 5.5 | 5.5 | 5.6 | 4.8 | 3.8 | 5.5 |
| TURELINE | 3.5 | 4.8 | 5.0 | 4.5 | 5.2 | 5.4 | 5.6 | 5.8 | 5.7 | 5.7 | 5.0 | 3.8 | 5.5 |
| SYN-1-88 | 3.8 | 4.7 | 5.6 | 4.7 | 5.2 | 5.5 | 5.2 | 5.4 | 5.6 | 5.3 | 5.1 | 4.2 | 5.4 |
| TENDENZ | 3.0 | 4.9 | 5.1 | 5.0 | 4.9 | 5.2 | 4.7 | 4.7 | 4.9 | 4.9 | 4.2 | 3.4 | 4.8 |
| BAR AS 492 | 2.8 | 3.9 | 4.0 | 4.1 | 4.5 | 4.3 | 4.5 | 4.5 | 5.0 | 4.9 | 4.4 | 4.1 | 4.6 |
| SEASIDE | 4.5 | 4.8 | 5.8 | 5.0 | 4.9 | 4.5 | 4.4 | 4.4 | 4.6 | 4.3 | 4.2 | 3.2 | 4.5 |
| LSD VALUE | 2.1 | 1.5 | 1.1 | 0.8 | 0.7 | 0.5 | 0.5 | 0.5 | 0.5 | 0.6 | 0.9 | 1.1 | 0.4 |

[1] To determine statistical differences among entries, subtract one entry's mean from another entry's mean. Statistical differences occur when this value is larger than the corresponding LSD Value (LSD 0.05).

[2] Source: National Turfgrass Evaluation Program. National Bentgrass Test - 1993 (Putting Greens)