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RYEGRASS FORAGE TESTS FOR 1988-89 AND 3 YEAR AVERAGES

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SUMMARY

Annual Italian ryegrass is an important forage crop in East Texas. This report presents data on forage yields, winterhardiness and crown rust resistance of commercial and experimental ryegrass varieties. Information on two experimental festulolium lines and a bromegrass line is also presented. Mean forage yield data are reported for 3 years at Overton and for crown rust severity levels and yield in 1989 from Angleton. Tetragold produced the highest yield over three years of 8,486 lbs of forage/ac, however, Marshall and Surrey produced nearly equal yields of 7,891 and 7,838 lbs/ac, respectively. Gulf remained fairly resistant to crown rust, while Marshall was susceptible.

INTRODUCTION

This report presents forage yields obtained in ryegrass variety tests conducted by Texas Agricultural Experiment Station personnel at Overton for 1988-89 and for a 3 year period from 1986-1989. These results are useful to growers in selecting the ryegrass variety which has the most potential in their area. Since there is a large difference in the price of seed of ryegrass varieties, these data should help growers determine whether higher prices of some varieties are worth the cost.

PROCEDURES

Available commercial and experimental ryegrass varieties were evaluated for adaptation and forage production in 1986-87, 1987-88 and 1988-89 at Overton, and for yield and crown rust resistance at Angleton in 1988-89. All tests were planted in a prepared seedbed. Planting dates at Overton were mid-September each year and on September 27, 1988 at Angleton. Seeding rates were 30 lbs/ac at both sites. At Overton, plot size was 4 x 10 ft with seed broadcast and covered by a cultipactor. At Angleton, seed was drilled into six ten-inch rows, with plots being 5 x 15 ft. Preplant fertilizer application rates at Angleton were 40-60-0 of N, P₂O₅, and K₂O, respectively. At Angleton, three N applications of 50 lbs each, were applied on December 15, February 17 and April 4. At Overton, fertility rates were 90-90-90-84 lbs/ac of N, P₂O₅, K₂O and sulfur. Nitrogen was applied at 50, 50 and 40 lbs/ac on November 14, January 30 and April 5, respectively. The entire plot

was harvested with a Hege plot harvester at a height of 2 inches during five harvest dates. At Angleton a 2.7 x 15 ft. strip was cut from the center of each plot at a 2-inch height with a flail mower. Experimental design was a randomized complete block with four replications at both locations.

RESULTS

Weather conditions in 1988-89 were not conducive to high forage yields. Data at Overton (Table 1) indicate low fall and winter forage production. This was the result of very warm growing conditions that may have reduced tillering of plants, and promoted early heading of some varieties. Freeze damage also resulted from a hard freeze in February. This freeze was more damaging than normal due to above average temperatures followed by the very cold temperatures. Marshall demonstrated above average freeze damage resistance, while Gulf was more susceptible than average. Three year mean yields (Table 2) are more useful in determining the true yield potential of the varieties. Tetragold, Marshall, Surry, Fla 80 and TX-R-85-2 demonstrated higher yield potential than other varieties.

Forage yields at Angleton (Table 3) were also below normal for 1988-89. A dry fall reduced early forage production. Mid-season (February 15) yields were good, and freeze damage reduced spring yields. Crown rust disease levels were high in 1989. Significant differences in crown rust resistance are demonstrated in the Angleton data for 1989 (Table 3). Note that Gulf remained a fairly resistant variety, while Marshall was susceptible.

TABLE 1. RYEGRASS AND FESCUE FORAGE VARIETY TEST AT OVERTON, TX 1988-89

| Variety | Harvest Dates | | | | | Total Yield | Freeze ² Damage Rating |
|--|---------------|--------|---------|---------|--------|-------------|-----------------------------------|
| | Dec. 14 | Mar. 8 | Mar. 30 | Apr. 21 | May 19 | | |
| -----pounds of oven dried forage per acre----- | | | | | | | |
| Marshall | 334 | 778 | 2033 | 1841 | 1742 | 6728 | 1 |
| Jackson | 191 | 849 | 1583 | 1823 | 1606 | 6052 | 2 |
| Surrey | 483 | 965 | 1421 | 1630 | 1525 | 6024 | 4 |
| Tetraploid 1 | 550 | 741 | 1305 | 1862 | 1561 | 6019 | 3 |
| LM AR 22 | 381 | 670 | 1224 | 1591 | 2075 | 5941 | 4 |
| Comet | 774 | 672 | 1195 | 1522 | 1741 | 5904 | 4 |
| LM-AR-2 | 320 | 844 | 1342 | 1668 | 1673 | 5847 | 3 |
| Noble Foundation-149 | 673 | 891 | 1317 | 1587 | 1375 | 5843 | 3 |
| Bulldog | 415 | 837 | 1397 | 1591 | 1489 | 5729 | 3 |
| LM-AR-42 | 556 | 967 | 1154 | 1472 | 1573 | 5722 | 5 |
| Gulf | 627 | 1063 | 1357 | 1567 | 1039 | 5653 | 6 |
| LM-AR-F44 | 338 | 481 | 1203 | 1534 | 2048 | 5604 | 4 |
| TX-R-85-2 | 711 | 837 | 1232 | 1670 | 1148 | 5598 | 4 |
| TX-R-85-1 | 464 | 962 | 1362 | 1643 | 1166 | 5597 | 4 |
| TX-R-88-1 | 232 | 841 | 1501 | 1708 | 1261 | 5543 | 4 |
| TX-R-87 Bulk | 536 | 898 | 1319 | 1664 | 1111 | 5528 | 4 |
| LMK-1 | 301 | 765 | 1407 | 1515 | 1535 | 5523 | 4 |
| WVPB-88-AR-601 | 814 | 453 | 1086 | 1488 | 1663 | 5504 | 4 |
| LM-B-7T | 344 | 675 | 1144 | 1665 | 1610 | 5438 | 4 |
| FPR-F41 | 395 | 604 | 1047 | 1458 | 1882 | 5386 | 4 |

TABLE 1. RYEGRASS AND FESCUE FORAGE VARIETY TEST AT OVERTON, TX 1988-89 (CONTINUED)

| Variety | Harvest Dates | | | | | Total Yield | Freeze ² Damage Rating |
|--|-----------------|------------------|------------------|------------------|------------------|------------------|-----------------------------------|
| | Dec. 14 | Mar. 8 | Mar. 30 | Apr. 21 | May 19 | | |
| -----pounds of oven dried forage per acre----- | | | | | | | |
| ETCO-9-88 | 406 | 615 | 1228 | 1824 | 1277 | 5350 | 4 |
| TX-R-86-2-L | 547 | 823 | 1239 | 1552 | 1160 | 5321 | 4 |
| TX-R-86-1 | 355 | 839 | 1321 | 1588 | 1075 | 5178 | 4 |
| TX-R-84-1 | 484 | 809 | 1302 | 1464 | 1032 | 5091 | 4 |
| Aubade | 799 | 559 | 951 | 1307 | 1446 | 5062 | 3 |
| Fla. 80 | 403 | 748 | 1403 | 1266 | 1228 | 5048 | 3 |
| Noble Foundation-2 | 519 | 770 | 1184 | 1452 | 1053 | 4978 | 3 |
| Magnolia | 448 | 712 | 1045 | 1480 | 1166 | 4851 | 6 |
| Penploid | 476 | 623 | 1094 | 1637 | 1021 | 4851 | 4 |
| Alamo | 513 | 456 | 1142 | 1530 | 1144 | 4785 | 5 |
| Max | 393 | 476 | 990 | 1194 | 1690 | 4743 | 4 |
| Penngrazer (tall fescue) | 138 | 137 | 617 | 1237 | 1879 | 4008 | 1 |
| Mean | 466 | 730 | 1255 | 1563 | 1437 | 5451 | |
| LSD (10% level) | NS ¹ | 287 ² | 308 ² | 231 ² | 298 ² | 975 ² | |
| CV | 72 | 33 | 21 | 13 | 18 | 15 | |

Planted on September 20, 1988. Seeding rate: 30 lbs/ac.

Fertilizer application: Preplant 700 lbs/ac of 13-13-13-12 (N, P₂O₅, K₂O, S).
 50 lbs/ac of actual N on November 14, 1988.
 50 lbs/ac of actual N on January 30, 1989.
 40 lbs/ac actual N on April 5, 1989.

¹NS indicates no significant differences in yield between varieties for the first harvest.

²Freeze damage ratings were recorded on 1 to 9 scale, where 1 = little damage and 9 = complete freeze back of tissue.

All varieties recovered from the injury.

³Differences in mean yields greater than the LSD value indicate significant difference 90 times out of 100.

TABLE 2. FORAGE YIELDS OF RYEGRASS AVERAGED OVER 3 YEARS 1986-87, 1987-88 AND 1988-89 AT OVERTON, TX

| Variety | Harvest Period | | | Average Total Yield |
|--|----------------|---------|---------|---------------------|
| | Nov-Dec | Jan-Feb | Mar-May | |
| -----pounds of oven dried forage per acre----- | | | | |
| Gulf | 530 | 1365 | 4952 | 6847 |
| Marshall | 610 | 966 | 6314 | 7891 |
| Tetragold | 796 | 1453 | 6236 | 8486 |
| Fla. 80 | 612 | 1472 | 5631 | 7716 |
| TX-R-86-1* | 676 | 1462 | 5464 | 7603 |
| Surrey | 621 | 1215 | 5995 | 7838 |
| TX-R-85-1* | 441 | 1336 | 5089 | 6895 |
| TX-R-85-2* | 778 | 1170 | 5785 | 7733 |
| TX-R-84-1* | 510 | 1110 | 4962 | 6582 |

*Experimental lines.

TABLE 3. DRY MATTER PRODUCTION AND RUST RATINGS OF ANNUAL RYEGRASS VARIETIES AT ANGLETON 1988-89

| Variety | 15 Feb | 3 Apr | 11 May | Total | 2 May |
|-------------------|----------------------------|------------------|------------------|------------------|------------------|
| | -----Dry matter lb/ac----- | | | | % Rust |
| LM-K-1 | 2046 | 1847 | 1881 | 5774 | 20.0 |
| LM-AR-2 | 2031 | 1774 | 1895 | 5700 | 12.5 |
| Penploid | 2383 | 1708 | 1567 | 5658 | 15.0 |
| TXR-86-1 | 2161 | 1821 | 1634 | 5616 | 20.0 |
| TXR-85-2 | 2102 | 1761 | 1733 | 5596 | 22.5 |
| Gulf | 2457 | 1564 | 1561 | 5582 | 17.5 |
| Tetraploid 1 | 2302 | 1686 | 1589 | 5577 | 22.5 |
| LM-AR-42 | 2057 | 1717 | 1787 | 5561 | 17.5 |
| TKR-88-1 | 2020 | 1778 | 1722 | 5520 | 22.5 |
| ETCO-9-88 | 2361 | 1568 | 1584 | 5513 | 17.5 |
| TXR-87-Bulk | 1991 | 1679 | 1835 | 5505 | 30.0 |
| Alamo | 2235 | 1641 | 1613 | 5489 | 17.5 |
| Florida-86-LR | 2079 | 1724 | 1644 | 5467 | 17.5 |
| TXR-86-2-L | 1995 | 1712 | 1739 | 5446 | 27.5 |
| Florida 80 | 2113 | 1677 | 1557 | 5347 | 15.0 |
| TXR-85-1 | 2039 | 1627 | 1666 | 5332 | 25.0 |
| MSR-86-1 | 2083 | 1564 | 1675 | 5322 | 10.0 |
| LM-AR-22 | 2005 | 1611 | 1628 | 5244 | 32.5 |
| TXR-84-1 | 1950 | 1554 | 1630 | 5134 | 27.5 |
| Magnolia | 2035 | 1569 | 1510 | 5114 | 15.0 |
| FPR-F41 | 2054 | 1490 | 1538 | 5082 | 52.5 |
| LM-AR-F44 | 1876 | 1577 | 1592 | 5045 | 30.0 |
| Bulldog | 1872 | 1417 | 1518 | 4807 | 40.0 |
| NF-2 | 1717 | 1378 | 1555 | 4650 | 47.5 |
| Marshall | 1421 | 1501 | 1500 | 4422 | 80.0 |
| WVPB-88-AR-601 | 1713 | 1308 | 1350 | 4371 | 72.5 |
| Penngrazer fescue | 1210 | 1360 | 1797 | 4367 | 22.5 |
| NF-149 | 1461 | 1313 | 1504 | 4278 | 50.0 |
| Max | 1702 | 1382 | 981 | 4065 | 87.5 |
| LM-B-7T | 1410 | 1290 | 1298 | 3998 | 65.0 |
| Aubade | 1443 | 1132 | 920 | 3495 | 72.5 |
| Comet | 1084 | 988 | 716 | 2788 | 87.5 |
| LSD .05 | 328 ^u | 248 ^u | 219 ^u | 504 ^u | 8.0 ^u |

^uDifferences in mean values between varieties greater than the LSD value indicate significant yield difference 95 times out of 100.