PROJECT TITLE: Irrigated and dryland production of soft white winter wheat as compared to irrigated hard red winter wheat, yield and quality. SARC. Huntley, 1990.

PROJECT LEADERS: G.F. Stallknecht and K.M. Gilbertson

PROJECT LOCATION: MSU - Southern Agricultural Research Center, Huntley, MT 59037

OBJECTIVES: Evaluate hard red and soft white winter wheat varieties under irrigation for economics of yield and quality. To evaluate soft white winter wheat varieties for adaptation and winter survival ratings for production in south-central Montana. To evaluate the use of soft white winter wheats as a feedlot ration in comparison to the traditional barley ration, (product economics and feed-to-gain evaluations).

RESULTS 1990: The yield test weight and lodging data are given in Tables 1 and 2. Yields of soft wheat ranged from 108 to 72 bu/A, with a test weight average of 55 lbs (Table 1). Table 2 describes the yield, test weight and lodging results of the hard red winter wheat. Yields ranged from 93 to 58 bu/A, with an average test weight of 59 lb/bu. Lodging was severe in many of the hard red wheat varieties. The exceptions were Judith, Bighorn, Norwin, Tiber and Redwin. Yield and test weight data for dryland soft white winter wheat is given in table 3.

SUMMARY: The variety trials have been terminated in 1990. The feeding study data has not been completely analyzed and it is expected that a complete report dealing with the feasibility of using soft white winter wheats as feedstuff grown in Montana will be written for 1992. As in previous years, the soft white wheat out yield the hard red varieties. However, under dryland cropping the yields of soft white winter wheats are either equal to or less than that of the hard red winters. Preliminary feedlot study results indicate that feed efficiencies are higher for cattle fed combinations of grains as compared to feeding a single grain feed in the finishing ration. Thus, if conclusive data information is generated that shows grain combination feeding will produce higher gains then, soft white wheat may be an option for Montana producers. The lodging results in 1990 are similar to the observations noted in previous years. Redwin, Tiber, and

Judith, all MSU developed varieties, have demonstrated to have excellent straw strength, and do not lodge under irrigation. Five varieties exhibited limited resistance to lodging, Hybritech 542, Windridge, Northstar, Cheyenne and Rocky.

FUTURE PLANS: This project will be summarized and data analyzed for a final report due in 1992.

**TABLE 1 . 1990 IRRIGATED SOFT WHITE WINTER WHEAT TRIAL SARC, HUNTLEY, MT.**

| VARIETY | YIELD BU/AC | TESTWT LBS/BU | PLANTHT INCHES | HEAD DATE | LODGING 7-16-90 PREV | SEVER | INDX |
|---|---|---|---|---|---|---|---|
| HILL 81 SOFT WHITE | 107.68 | 56.27 | 42.67 | 164.33 | 0.0 | 0.0 | 0.00 |
| STEVENS SOFT WHITE | 107.20 | 54.30 | 41.67 | 162.33 | 0.0 | 0.0 | 0.00 |
| WA7166 SOFT WHITE | 106.36 | 55.90 | 39.67 | 163.00 | 0.0 | 0.0 | 0.00 |
| MALCOLM SOFT WHITE | 98.23 | 55.07 | 39.33 | 162.33 | 0.0 | 0.0 | 0.00 |
| OVESON SOFT WHITE | 97.69 | 53.73 | 41.00 | 165.33 | 0.0 | 0.0 | 0.00 |
| DUSTY SOFT WHITE | 92.48 | 54.43 | 39.67 | 166.00 | 0.0 | 0.0 | 0.00 |
| CASHUP SOFT WHITE | 92.33 | 54.50 | 38.67 | 163.67 | 0.0 | 0.0 | 0.00 |
| BASIN SOFT WHITE | 92.05 | 54.07 | 37.00 | 164.67 | 0.0 | 0.0 | 0.00 |
| WA7163 SOFT WHITE | 90.92 | 53.80 | 43.67 | 162.67 | 0.0 | 0.0 | 0.00 |
| DAWS SOFT WHITE | 90.41 | 54.93 | 40.00 | 164.00 | 0.0 | 0.0 | 0.00 |
| NUGAINES SOFT WHITE | 83.53 | 54.37 | 38.33 | 163.00 | 0.0 | 0.0 | 0.00 |
| LEWJAIN SOFT WHITE | 82.99 | 52.27 | 39.33 | 166.00 | 2.0 | 20.0 | 4.44 |
| JOHN SOFT WHITE | 74.84 | 55.80 | 43.00 | 163.00 | 2.0 | 20.0 | 4.44 |
| REDWIN HARD RED | 72.51 | 60.27 | 51.67 | 164.00 | 0.0 | 0.0 | 0.00 |
| ******* STATISTICAL TABLE ******* | | | | | | | |
| EXPERIMENTAL MEANS | 92.09 | 54.98 | 41.12 | 163.88 | | | |
| TOTAL OBSERVATIONS | 42.00 | 42.00 | 42.00 | 42.00 | | | |
| NO. OF REPLICATIONS | 3.00 | 3.00 | 3.00 | 3.00 | | | |
| C.V. 1: (S/MEAN)*100 | 8.03 | 1.91 | 6.89 | .55 | | | |
| C.V. 2: (S OF MEAN/MEAN)*100 | 4.64 | 1.11 | 3.98 | .32 | | | |
| LSD (0.05) | 12.42 | 1.77 | 4.76 | 1.53 | | | |

DATE PLANTED: 10-11-89
DATE HARVESTED: 8-08-90

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TABLE 2 . **1990 IRRIGATED HARD RED WINTER WHEAT TRIAL, SARC, HUNTLEY, MT.**

| | VARIETY | YIELD BU/AC | TESTWT LBS/BU | PLANTHT INCHES | HEAD DATE | LODGING 7-16-90 PREV | SEVER | INDX |
|---|---|---|---|---|---|---|---|---|
| QT 542 | HYBRITECH | 92.58 | 60.20 | 47.33 | 158.00 | 6.0 | 99.0 | 66.0 |
| MT 8039 | JUDITH | 91.03 | 58.47 | 43.00 | 162.00 | 0.0 | 0.0 | 0.0 |
| RH78W296 | BIGHORN | 85.64 | 59.50 | 41.67 | 162.33 | 0.0 | 0.0 | 0.0 |
| CI 17902 | WINRIDGE | 81.82 | 57.90 | 47.00 | 166.33 | 5.0 | 99.0 | 55.0 |
| MT 7811 | FRD/WNK//MT6928/TDR | 78.09 | 55.43 | 45.33 | 162.33 | 6.0 | 99.0 | 66.0 |
| CI 15075 | CENTURK | 73.46 | 60.73 | 45.67 | 159.33 | 8.0 | 99.0 | 88.0 |
| PI491533 | NORWIN | 72.36 | 57.20 | 37.00 | 164.33 | 0.0 | 0.0 | 0.0 |
| PI517194 | TIBER | 70.89 | 59.70 | 47.00 | 164.67 | 0.0 | 0.0 | 0.0 |
| CI 13670 | WINALTA | 70.76 | 60.57 | 53.00 | 163.33 | 8.0 | 99.0 | 88.0 |
| CI 17860 | NEELEY | 70.22 | 58.53 | 43.67 | 162.67 | 7.0 | 99.0 | 77.0 |
| 2 | WESTON | 69.19 | 59.47 | 45.33 | 162.00 | 9.0 | 99.0 | 99.0 |
| CI 17844 | REDWIN | 62.74 | 60.10 | 50.33 | 164.00 | 0.0 | 99.0 | 0.0 |
| CI 17735 | NORSTAR | 62.14 | 60.40 | 53.33 | 165.33 | 6.0 | 99.0 | 66.0 |
| CI 8885 | CHEYENNE | 62.14 | 60.23 | 44.00 | 165.67 | 6.0 | 99.0 | 66.0 |
| CI 17879 | ROCKY | 61.71 | 61.23 | 45.00 | 160.67 | 5.0 | 99.0 | 55.0 |
| 3 | MANNING | 58.25 | 54.40 | 43.67 | 162.00 | 9.0 | 99.0 | 99.0 |
| PI491532 | CREE | 58.03 | 60.20 | 43.67 | 164.67 | 8.0 | 99.0 | 88.0 |
| 1 | BLIZZARD | 57.98 | 59.30 | 46.00 | 165.00 | 9.0 | 99.0 | 99.0 |

******* STATISTICAL TABLE *******

| | | | | |
|---|---|---|---|---|
| EXPERIMENTAL MEANS | 71.06 | 59.09 | 45.67 | 163.04 |
| TOTAL OBSERVATIONS | 54.00 | 54.00 | 54.00 | 54.00 |
| NO. OF REPLICATIONS | 3.00 | 3.00 | 3.00 | 3.00 |
| NO. OF VARIETIES | 18.00 | 18.00 | 18.00 | 18.00 |
| C.V. 1: (S/MEAN)*100 | 12.38 | 1.64 | 7.12 | .68 |
| C.V. 2: (S OF MEAN/MEAN)*100 | 7.15 | .95 | 4.11 | .39 |
| LSD (0.05) | 14.60 | 1.61 | 5.40 | 1.83 |

DATE PLANTED: 10-11-89
DATE HARVESTED: 8-08-90

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TABLE 3 . **1990 DRYLAND SOFT WHITE WINTER WHEAT TRIAL, SARC, HUNTLEY, MT.**

| VARIETY | YIELD BU/AC | TESTWT LBS/BU | PLANTHT INCHES | HEAD DATE |
|---|---|---|---|---|
| DUSTY SOFT WHITE | 54.00 | 47.43 | 33.33 | 165.00 |
| MALCOLM SOFT WHITE | 53.07 | 47.43 | 32.67 | 162.67 |
| LEWJAIN SOFT WHITE | 52.19 | 48.70 | 30.33 | 167.00 |
| JOHN SOFT WHITE | 51.61 | 50.73 | 33.67 | 164.33 |
| HILL 81 SOFT WHITE | 50.94 | 49.10 | 34.67 | 165.33 |
| WA7166 SOFT WHITE | 49.38 | 48.53 | 34.00 | 163.67 |
| DAWS SOFT WHITE | 47.05 | 48.00 | 32.33 | 164.00 |
| CASHUP SOFT WHITE | 46.33 | 49.00 | 31.67 | 164.00 |
| NUGAINES SOFT WHITE | 46.07 | 50.23 | 28.67 | 164.00 |
| OVESON SOFT WHITE | 44.77 | 47.47 | 34.33 | 164.67 |
| WA7163 SOFT WHITE | 43.82 | 48.17 | 33.00 | 163.67 |
| STEVENS SOFT WHITE | 42.84 | 45.10 | 32.00 | 162.00 |
| REDWIN HARD RED | 42.56 | 56.17 | 40.33 | 163.67 |
| BASIN SOFT WHITE | 41.54 | 47.97 | 25.00 | 166.33 |
| ***** **STATISTICAL TABLE** ***** | | | | |
| EXPERIMENTAL MEANS | 47.58 | 48.86 | 32.57 | 164.31 |
| TOTAL OBSERVATIONS | 42.00 | 42.00 | 42.00 | 42.00 |
| NO. OF REPLICATIONS | 3.00 | 3.00 | 3.00 | 3.00 |
| NO. OF VARIETIES | 14.00 | 14.00 | 14.00 | 14.00 |
| REP. MEAN SQUARE | .89 | .43 | .07 | 2.31 |
| VAR. MEAN SQUARE | 53.93 | 18.73 | 34.74 | 5.20 |
| ERROR MEAN SQUARE | 38.03 | .62 | 1.33 | .49 |
| ERROR DEGREES OF FREEDOM | 26.00 | 26.00 | 26.00 | 26.00 |
| F TEST FOR REPS. | .02 | .69 | .05 | 4.72 |
| F TEST FOR VAR. | 1.42 | 30.21 | 26.16 | 10.64 |
| STANDARD ERROR | 6.17 | .79 | 1.15 | .70 |
| STANDARD ERROR OF THE MEAN | 3.56 | .45 | .67 | .40 |
| C.V. 1: (S/MEAN)*100 | 12.96 | 1.61 | 3.54 | .43 |
| C.V. 2: (S OF MEAN/MEAN)*100 | 7.48 | .93 | 2.04 | .25 |
| LSD (0.05) | 10.35 | 1.32 | 1.93 | 1.17 |

DRYSOFT90.WWD
DRYSOFT.STT