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3

**PROJECT TITLE:** Dryland Evaluation of Standard and Specialty Oil Safflower Varieties.

**PROJECT LEADER:** Gregg R. Carlson, Agronomist - Havre

**PROJECT PERSONNEL:** Jerald W. Bergman, Safflower Breeder - Sidney

**OBJECTIVES:**

Safflower serves as an excellent crop component in many areas of northern Montana in flexible dryland rotations with small cereal grains. A significant portion of the north central cropping area has climatic conditions suitable for production of standard oil safflower; and certain smaller, yet significant areas further have specific climatic conditions required for production of specialty safflower lines of the high-oleic oil type. It is the objective of this study to evaluate existing commercial entries along with promising experimental lines being developed at Sidney to determine varietal appropriateness, and subsequent release and recommendation information specific to environmental conditions in northern areas. The MAPS program is utilized to refine the definition of areas appropriate for the production of quality safflower.

**RESULTS:**

Entries in the 1999 safflower variety trial performed slightly above to well above normal when compared with long-term safflower performance at Havre. Overall stand and biomass development was somewhat below that expected under 1999 growing conditons. Flowering date (August 5) was later than can normally be considered comfortable at Havre in terms of achieving an adequate stage of maturity before first frost. However, first fall frost was 8 days later than normal.

July mean temperature was 66.2 degrees F (3.5 degrees cooler than normal), and Total Growing Degree Day (GDD) values (base 50) were 90 percent of normal. Mean yields were 124 percent of long-term Havre averages. Oil values were not yet available at the time this report was prepared.

Stand percent, flower date, plant height, yield, and test weight data for the 1999 trial are presented in Table 1. Long-term (1990-1999) yield and percent oil summaries on selected entries will be prepared when oil values are available.

**SUMMARY:**

Single trials are established annually on-station at Havre using standard plot techniques in a randomized complete block design. Entries were planted in 4 or 6-row plots, 20 feet in length on a 12-inch spacing utilizing a `Rem' self-propelled cone seeder equipped with `Acra-plant' hoe openers. Plots were trimmed to 16 feet and harvested with a plot combine.

**FUTURE PLANS:**

It is planned that these investigations be continued on an annual basis in on-going support of the Montana safflower breeding and variety development project.

231

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TABLE 1. DRYLAND FALLOW SAFFLOWER VARIETY NURSERY. NORTHERN AGRICULTURAL RESEARCH CENTER. HAVRE, MONTANA. 1999.

| ID | SOURCE | STAND % | [1]FLOWER DATE | PLNT HT Inches | YIELD Lbs/Ac | TESTWT Lbs/Bu | OIL% @0%Moi | OIL% @8%Moi | Lbs OIL @8%Moi |
|---|---|---|---|---|---|---|---|---|---|
| GW 9025 | 97 California | 84.27 | 218.00 | 24.93 | 1715.93 | 44.57 | . | . | . |
| GW 9024 | 97 California | 81.47 | 216.67 | 23.62 | 1670.63 | 44.20 | | | |
| 96B 7026 | 98 DOL5 #102 | 91.67 | 217.33 | 21.13 | 1391.00 | 43.23 | | | |
| 96B 6985 | 98 DOL4 #127 | 92.60 | 215.67 | 20.60 | 1389.60 | 43.90 | | | |
| 95B 6894 | 98 DOL1 #124 | 89.33 | 218.00 | 21.92 | 1368.10 | 41.17 | | | |
| 95B 7446 | 98 DOL1 #127 | 94.87 | 215.00 | 25.33 | 1366.80 | 43.67 | | | |
| GW 9023 | 97 California | 88.87 | 216.33 | 26.77 | 1366.17 | 44.70 | | | |
| 96B 6862 | 98 DOL4 #123 | 87.50 | NA | 21.65 | 1357.87 | 45.23 | | | |
| 97B 1286 | 98 WLi1 #328/130 | 87.03 | 216.67 | 22.31 | 1347.73 | 41.37 | | | |
| 96B 6527 | 98 DOL3 #119 | 96.27 | 214.67 | 23.10 | 1345.40 | 43.43 | | | |
| MORLIN | MT CERT. #971-916 | 93.07 | 220.00 | 22.70 | 1342.43 | 41.17 | P | P | P |
| MONT2003 | 96 DOL5 #130(95B7348) | 91.23 | 215.67 | 21.78 | 1311.37 | 42.47 | | | |
| 97B 7185 | 98 WOL7 #302/124 | 85.63 | 215.33 | 24.15 | 1281.13 | 43.07 | e | e | e |
| 97B 7017 | 98 WOL7 #329/117 | 92.13 | 215.67 | 21.26 | 1278.70 | 42.23 | | | |
| FINCH | ND FSF #95/21W | 89.37 | 216.67 | 24.02 | 1267.47 | 45.37 | n | n | n |
| 96B 7005 | 98 DOL4 #130 | 93.03 | 216.00 | 24.02 | 1254.27 | 44.13 | | | |
| 95B 7181 | 96 DOL5 #224/115 | 93.53 | NA | 23.75 | 1245.53 | 45.43 | d | d | d |
| 96B 6749 | 98 DOL4 #109 | 87.50 | 218.33 | 25.72 | 1202.10 | 40.70 | | | |
| S-518 | 97 Williston | 93.53 | 218.00 | 22.18 | 1180.87 | 40.93 | i | i | i |
| 95B 7174 | 96 DOL5 #114 | 92.60 | 217.00 | 21.92 | 1176.87 | 42.30 | | | |
| 97B 6712 | 98 DLO6 #123 | 94.43 | 219.00 | 24.15 | 1171.53 | 40.80 | n | n | n |
| 95B 3538 | 97 DLi1 #126 | 93.50 | 219.33 | 22.97 | 1160.70 | 42.77 | | | |
| MONT2000 | CA #97A-6911-7081 | 92.60 | 215.00 | 23.36 | 1152.13 | 41.93 | g | g | g |
| 96B 6798 | 97 DOL6 #211/110 | 87.47 | 215.33 | 23.10 | 1126.77 | 43.43 | | | |
| 96B 6170 | 97 DOL2 #118 | 90.73 | 216.67 | 25.07 | 1114.47 | 45.43 | | | |
| 96B 7018 | 97 DOL7 #212/130 | 92.63 | NA | 23.10 | 1112.13 | 42.17 | | | |
| 97B 1333 | 98 WLi2 #304/101 | 78.73 | NA | 21.52 | 1107.87 | 41.03 | | | |
| 91B 6429 | 95B 6264&96B 6190 | 95.83 | 218.67 | 22.31 | 1093.53 | 41.57 | | | |
| 95B 2896 | 98 MDSVT #107 | 96.73 | 218.67 | 22.83 | 1063.47 | 41.07 | | | |
| MONT2001 | MT CERT. #971-912 | 93.53 | 216.00 | 21.39 | 1059.97 | 41.90 | | | |
| 96B 7261 | 98 DOL5 #119 | 92.60 | 216.00 | 20.47 | 1059.30 | 43.20 | | | |
| CENTENNL | CSF #95/24W | 93.50 | 217.67 | 26.77 | 1034.63 | 42.80 | | | |
| 96B 6054 | 97 DOL1 #109 | 89.83 | 214.33 | 21.92 | 1027.07 | 39.30 | | | |
| 97B 6821 | 98 DLO6 #125 | 89.37 | 217.00 | 24.15 | 974.10 | 42.43 | | | |
| ERLIN | MT Cert. #951-900 | 87.97 | 217.00 | 24.28 | 882.30 | 41.47 | | | |
| 91B 3842 | 96 DLi2 #316/113 | 93.53 | 215.67 | 25.07 | 879.43 | 40.13 | | | |
| EXPERIMENTAL MEANS | | 90.79 | 216.79 | 23.20 | 1218.87 | 42.63 | . | . | . |
| C.V. 2: (S OF MEAN/MEAN)*100 | | 4.74 | .35 | 5.29 | 8.83 | .58 | - | - | - |
| LSD (0.05) | | 12.13 | 2.16 | 3.46 | 303.70 | .70 | - | - | - |

[1]No. Days from January 1 (217 = August 5)
Flowering Dates were missed for 95B 7181, 96B 6862, 96B 7018, and 97B 1333
Statistical summary above for flowering date reflects a separate ANOVA on only those entries for which flowering dates were recorded.

Note: This nursery suffered minor to moderate hail damage during vegetative growth.

CLIMATIC and NURSERY MANAGEMENT DATA

Summarization Pending...