*Progress Report on*

# PERFORMANCE OF EXPERIMENTAL SINGLE CROSS CORN HYBRIDS IN NORTH DAKOTA

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**The performance of experimental single cross corn hybrids is of considerable interest to individuals and companies interested in developing commercial hybrids. Yields of single cross hybrids can be used to predict (1) the future performance of that hybrid per se, (2) the performance of double or three-way crosses containing the same inbred lines, and (3) which inbred lines might best be included in a breeding program to produce even better hybrids for the future.**

Performance data for commercial hybrids and a few experimental hybrids are available (1), but are of limited value in predicting hybrid performance since pedigrees of commercial hybrids are not public knowledge. Some information on experimental hybrids was published in 1967 (2), but more extensive and current information is lacking.

Adequate evaluation of a hybrid requires testing for a number of years and at a number of locations. Single-year results at a single location can be very misleading for a complex character such as grain yield.

With these thoughts in mind, the following data are presented to provide interested seedsmen with performance data on experimental single crosses that have been tested for four years at various locations in North Dakota.

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## Procedure

The data presented are averages of replicated one-row plots grown in randomized complete

**Table 1. Field, Cultural Conditions, and Harvest Information for Single-Cross Corn Performance Tests, 1969-72, North Dakota.**

| Location | Year | N | $P_2O_5$ | $K_2O$ | Previous Crop | Row Width | Plant Population | Planting Date | Harvest* Date |
|---|---|---|---|---|---|---|---|---|---|
| Fargo | 1969 | 25 | 13 | 6 | Flax | 36" | 13,000 | May 14 | Oct. 12 |
| | 1970 | 26 | 13 | 6 | Corn | 36" | 12,000 | May 26 | Sept. 29 |
| | 1971 | 26 | 13 | 6 | Oats | 36" | 16,000 | May 17 | Oct. 1 |
| | 1972 | 80 | 25 | 13 | Alfalfa | 30" | 18,000 | June 1 | Oct. 9 |
| Larimore | 1969 | 50 | 50 | 25 | Wheat | 38" | 18,000 | May 22 | Oct. 14 |
| | 1970 | 22 | 53 | 14 | Wheat | 38" | 18,000 | May 27 | Oct. 17 |
| | 1971 | 38 | 38 | 16 | Wheat | 38" | 18,000 | May 21 | Oct. 23 |
| | 1972 | 44 | 57 | 15 | Wheat | 38" | 15,000 | May 20 | Sept. 20 |
| Mandan | 1969 | 40 | 40 | 0 | Wheat | 40" | 11,000 | May 19 | Oct. 7 |
| | 1970 | 40 | 40 | 0 | Wheat | 42" | 12,000 | May 22 | Sept. 22 |
| | 1971 | 40 | 40 | 0 | Wheat | 38" | 12,000 | May 19 | Sept. 8 |
| | 1972 | 40 | 40 | 0 | Wheat | 30" | 15,000 | May 17 | Sept. 11 |
| Mooreton | 1969 | 40 | 40 | 20 | Corn | 38" | 18,000 | May 14 | Oct. 6 |
| | 1970 | 75 | 18 | 70 | Corn | 38" | 22,000 | May 16 | Oct. 3 |
| | 1971 | 136 | 108 | 36 | Corn | 30" | 20,000 | May 6 | Oct. 9 |
| | 1972 | 96 | 64 | 32 | Soybeans | 30" | 16,000 | June 6 | Oct. 13 |
| Sheldon | 1969 | 40 | 40 | 20 | Corn | 38" | 18,000 | May 17 | Oct. 15 |
| | 1970 | 108 | 96 | 46 | Corn | 38" | 18,000 | May 21 | Oct. 13 |
| | 1971 | 70 | 68 | 20 | Corn | 38" | 19,000 | May 18 | Oct. 2 |
| | 1972 | 100 | 70 | 70 | Corn | 38" | 16,000 | May 21 | Oct. 5 |

**Since the plots were hand harvested, it was often necessary to harvest the corn before it was dry enough to combine and these dates are not necessarily normal harvest dates for the respective locations.*

block or lattice experimental designs. The corn was seeded at an excessive rate and thinned to a desired stand (Table 1). Yields were not adjusted for stand. Most plots were approximately 1/1,000 of an acre in size. Grain yields are reported in bushels of shelled corn per acre at 15.5 per cent moisture. The ears were harvested by hand, weighed, dried and reweighed to determine ear moisture percentage. The grain was shelled from the cob and weighed to determine yield and shelling percentage.

The plant and ear heights are averages of five measurements per plot, taken from the soil surface to the base of the tassel and the uppermost earbearing node, respectively. Stalk lodging is reported as the percentage of ear-bearing stalks which were broken over below the ear at harvest, while root lodging is the percentage of stalks leaning 30 degrees or more from vertical at harvest.

Grain yield averages were taken over a four-year period of 1969 through 1972. Other traits are averages of 1971 and 1972 growing seasons. Cultural conditions for the various trials are presented in Table 1.

No statistical analysis of data combined over years is presented because these are select groups of hybrids and few significant differences in yield would be evident.

**Table 2. Average Yields of Selected Hybrids by Years and Location in Bushels Per Acre.**

| Location | 1969 | 1970 | 1971 | 1972 | Mean |
|---|---|---|---|---|---|
| Fargo (early) | 85.9 | 59.8 | 75.3 | 100.0 | 80.2 |
| Mandan | 56.1 | 50.8 | 47.6 | 44.6 | 49.8 |
| Larimore | 74.3 | 66.8 | 102.4 | 76.8 | 80.1 |
| Fargo (late) | 81.7 | 60.3 | 82.9 | 86.0 | 77.7 |
| Mooreton | 69.4 | 123.1 | 115.4 | 76.2 | 96.0 |
| Sheldon | 113.6 | 94.3 | 92.9 | 90.7 | 97.9 |

## Results and Discussion

The mean yields ranged from 44.6 bushels per acre at Mandan in 1972 to 123.1 bushels per acre in 1970 at Mooreton (Table 2). Hybrids which exhibited poor potential or for which there were inadequate seed supplies were dropped from the group annually. Therefore the ranges in yield probably were reduced. Hybrids also were added to the trials each year. Their performance data will be presented when the desired amount of testing has been done.

The data for 20 early single crosses grown at Fargo indicate that yields ranged from 69.2 to 88.0 bushels per acre (Table 3). Although these yield differences were probably not statistically significant, certain trends seem evident. Of the hybrids tested, those with ND474, CO303, NDB8,

**Table 3. Agronomic Data for 20 Early Single-Cross Hybrids Grown at Fargo.**

| Hybrid | Pedigree | Ear Moisture % | Shelling % | Plant Ht. In. | Ear Ht. In. | Stalk Lodg. % | Root Lodg. % | Test Weight Lb/Bu | Yield Bu/Acre |
|---|---|---|---|---|---|---|---|---|---|
| NDB479 | NDB8 x CO303 | 28.7 | 84.8 | 77.3 | 39.3 | 1.0 | 4.2 | 58.0 | 88.0 |
| NDB575 | ND474 x CO303 | 28.5 | 84.2 | 72.2 | 30.0 | 7.6 | 2.0 | 59.9 | 87.4 |
| NDB564 | ND474 x ND363 | 27.5 | 83.2 | 68.1 | 29.2 | 2.2 | 2.4 | 59.9 | 86.0 |
| NDB477 | ND468 x NDB8 | 27.9 | 85.0 | 74.5 | 38.0 | 9.2 | 2.8 | 55.5 | 85.1 |
| NDB85 | A90 x CO303 | 26.8 | 80.5 | 70.4 | 29.2 | 2.0 | 2.2 | 58.7 | 84.7 |
| NDB569 | ND474 x NDB8 | 27.5 | 82.8 | 74.2 | 38.6 | 2.6 | 3.4 | 58.6 | 84.1 |
| NDB341 | ND468 x A90 | 28.0 | 80.5 | 69.8 | 31.1 | 1.7 | 4.6 | 56.4 | 82.6 |
| NDB614 | ND468 x ND407 | 31.7 | 83.9 | 72.4 | 33.4 | 4.4 | 3.7 | 56.2 | 82.0 |
| NDB343 | ND474 x A90 | 29.8 | 78.0 | 64.5 | 28.1 | 2.6 | 1.4 | 59.0 | 81.9 |
| NDB90 | ND468 x CO303 | 26.1 | 85.1 | 70.0 | 28.4 | 5.0 | 3.4 | 54.0 | 81.6 |
| NDB411 | ND363 x ND468 | 24.7 | 84.4 | 69.9 | 29.7 | 4.8 | 4.1 | 56.4 | 81.2 |
| NDB408 | ND363 x A90 | 27.7 | 77.8 | 65.9 | 27.4 | 1.6 | 4.1 | 58.7 | 79.8 |
| NDB499 | ND474 x ND364 | 27.3 | 83.0 | 67.6 | 29.1 | 4.5 | 2.4 | 60.8 | 78.5 |
| NDB496 | ND364 x ND468 | 23.9 | 83.4 | 67.7 | 27.1 | 7.2 | 0.0 | 56.7 | 77.3 |
| NDB399 | ND364 x NDB8 | 26.3 | 82.7 | 70.0 | 34.2 | 2.5 | 1.5 | 58.1 | 77.2 |
| NDB582 | ND363 x CO303 | 22.8 | 82.5 | 68.3 | 29.5 | 6.5 | 6.2 | 57.8 | 76.2 |
| NDB410 | ND363 x NDB8 | 27.5 | 83.0 | 71.4 | 34.8 | 0.0 | 3.2 | 58.0 | 74.3 |
| NDB344 | ND364 x A90 | 29.5 | 78.1 | 63.1 | 27.9 | 1.1 | 3.9 | 57.9 | 73.8 |
| NDB87 | ND364 x CO303 | 20.3 | 84.0 | 64.4 | 27.9 | 14.4 | 5.8 | 57.4 | 73.8 |
| NDB309 | ND364 x MS1334 | 28.0 | 75.9 | 69.9 | 30.5 | 17.1 | 4.1 | 59.3 | 69.2 |

**Table 4. Agronomic Data for 22 Early Single-Cross Hybrids Grown at Mandan.**

| Hybrid | Pedigree | Ear Moisture % | Shelling % | Plant Ht. In. | Ear Ht. In. | Stalk Lodg. % | Root Lodg. % | Test Weight Lb/Bu | Yield Bu/Acre |
|---|---|---|---|---|---|---|---|---|---|
| NDB90 | ND468 x CO303 | 31.2 | 82.8 | 55.6 | 21.5 | 0.0 | 2.6 | 51.5 | 55.8 |
| NDB343 | ND474 x A90 | 38.2 | 76.9 | 54.0 | 23.4 | 1.3 | 0.0 | 56.4 | 55.3 |
| NDB85 | A90 x CO303 | 33.9 | 78.7 | 57.5 | 21.6 | 0.0 | 1.6 | 56.2 | 53.6 |
| NDB477 | ND468 x NDB8 | 42.4 | 82.7 | 55.8 | 26.0 | 3.6 | 0.0 | 53.0 | 52.3 |
| NDB499 | ND474 x ND364 | 32.7 | 81.6 | 53.4 | 21.2 | 1.2 | 1.2 | 58.1 | 51.8 |
| NDB575 | ND474 x CO303 | 32.4 | 81.2 | 56.4 | 21.7 | 3.2 | 2.4 | 58.2 | 51.6 |
| NDB573 | ND474 x W673 | 37.6 | 80.0 | 55.4 | 26.1 | 2.9 | 1.4 | 58.3 | 51.5 |
| NDB564 | ND363 x ND474 | 32.8 | 81.9 | 54.8 | 21.8 | 0.0 | 1.4 | 57.0 | 51.2 |
| NDB341 | ND468 x A90 | 39.8 | 78.4 | 55.0 | 21.6 | 0.0 | 0.0 | 54.3 | 51.2 |
| NDB569 | ND474 x NDB8 | 36.9 | 82.3 | 58.9 | 29.0 | 1.2 | 0.0 | 56.8 | 50.4 |
| NDB582 | ND363 x CO303 | 27.8 | 81.6 | 55.5 | 20.7 | 1.3 | 1.3 | 55.8 | 50.2 |
| NDB479 | NDB8 x CO303 | 36.7 | 84.7 | 56.8 | 24.6 | 0.0 | 1.2 | 55.8 | 49.4 |
| NDB408 | ND363 x A90 | 35.9 | 77.2 | 52.3 | 21.5 | 2.5 | 0.0 | 55.6 | 49.0 |
| NDB493 | CO303 x W673 | 34.4 | 81.2 | 55.7 | 25.0 | 1.4 | 6.6 | 56.8 | 48.9 |
| NDB411 | ND363 x ND468 | 36.6 | 88.5 | 53.9 | 21.5 | 0.0 | 0.0 | 53.4 | 48.9 |
| NDB344 | ND364 x A90 | 36.1 | 76.3 | 49.7 | 20.0 | 0.0 | 0.0 | 56.3 | 48.6 |
| NDB399 | ND364 x NDB8 | 35.8 | 82.2 | 54.1 | 26.4 | 2.4 | 0.0 | 56.2 | 48.0 |
| NDB496 | ND364 x ND468 | 34.6 | 83.8 | 50.8 | 19.8 | 1.2 | 2.4 | 52.0 | 47.6 |
| NDB614 | ND468 x ND407 | 44.7 | 81.0 | 57.0 | 26.2 | 0.0 | 0.0 | 54.2 | 47.5 |
| NDB87 | ND364 x CO303 | 27.2 | 82.6 | 51.6 | 19.8 | 2.8 | 0.0 | 55.4 | 46.9 |
| NDB410 | ND363 x NDB8 | 36.8 | 82.2 | 54.7 | 23.6 | 0.0 | 1.6 | 55.8 | 45.4 |
| NDB309 | ND364 x MS1334 | 33.2 | 69.3 | 54.1 | 22.4 | 0.0 | 2.2 | 56.6 | 39.2 |

**Table 5. Agronomic Data for 21 Early Single-Cross Hybrids Grown at Larimore.**

| Hybrid | Pedigree | Ear Moisture % | Shelling % | Plant Ht. In. | Ear Ht. In. | Stalk Lodg. % | Root Lodg. % | Test Weight | Yield Bu/Acre |
|---|---|---|---|---|---|---|---|---|---|
| NDB399 | ND364 x NDB8 | 36.3 | 83.6 | 61.5 | 28.2 | 4.0 | 9.8 | 59.1 | 85.5 |
| NDB493 | CO303 x W673 | 35.4 | 82.1 | 62.8 | 27.6 | 32.6 | 41.8 | 60.2 | 85.2 |
| NDB411 | ND363 x ND468 | 38.5 | 84.6 | 64.2 | 26.0 | 11.0 | 17.8 | 56.0 | 84.6 |
| NDB85 | A90 x CO303 | 33.2 | 76.0 | 63.2 | 25.4 | 4.2 | 10.6 | 57.1 | 84.2 |
| NDB496 | ND364 x ND468 | 35.8 | 87.4 | 61.2 | 25.8 | 9.8 | 22.0 | 56.2 | 83.6 |
| NDB90 | ND468 x CO303 | 36.8 | 86.5 | 61.6 | 24.0 | 21.4 | 19.2 | 54.4 | 83.2 |
| NDB343 | ND474 x A90 | 37.0 | 78.0 | 58.4 | 14.8 | 0.0 | 1.2 | 58.1 | 82.1 |
| NDB408 | ND363 x A90 | 40.4 | 80.8 | 60.6 | 22.8 | 9.6 | 7.4 | 56.9 | 81.8 |
| NDB573 | ND474 x W673 | 36.4 | 81.7 | 59.0 | 30.0 | 9.1 | 10.7 | 61.4 | 81.2 |
| NDB87 | ND364 x CO303 | 33.4 | 83.2 | 59.8 | 23.8 | 23.6 | 17.8 | 57.5 | 81.0 |
| NDB569 | ND474 x NDB8 | 37.4 | 81.4 | 65.8 | 33.6 | 9.3 | 4.2 | 59.6 | 80.2 |
| NDB614 | ND468 x ND407 | 43.7 | 86.6 | 65.6 | 33.0 | 7.4 | 0.9 | 54.8 | 80.0 |
| NDB410 | ND363 x NDB8 | 35.8 | 83.2 | 64.8 | 29.5 | 5.8 | 6.2 | 59.0 | 80.0 |
| NDB564 | ND363 x ND474 | 36.6 | 83.6 | 59.3 | 24.1 | 8.4 | 6.4 | 59.0 | 79.2 |
| NDB575 | ND474 x CO303 | 34.3 | 83.7 | 59.6 | 24.2 | 8.4 | 7.2 | 58.3 | 79.2 |
| NDB477 | ND468 x NDB8 | 40.6 | 84.3 | 67.7 | 32.8 | 3.1 | 5.4 | 56.1 | 78.0 |
| NDB341 | ND468 x A90 | 39.6 | 79.3 | 66.2 | 27.9 | 2.0 | 12.5 | 55.2 | 77.4 |
| NDB499 | ND474 x ND364 | 29.2 | 77.2 | 56.0 | 22.2 | 7.0 | 4.4 | 60.4 | 77.1 |
| NDB344 | ND364 x A90 | 34.6 | 74.8 | 56.2 | 21.5 | 3.6 | 3.4 | 58.2 | 76.6 |
| NDB479 | NDB8 x CO303 | 39.5 | 83.6 | 64.8 | 29.5 | 16.3 | 1.4 | 57.8 | 73.7 |
| NDB309 | ND364 x MS1334 | 36.2 | 79.6 | 61.6 | 23.8 | 12.5 | 21.4 | 59.2 | 70.8 |

and ND468 in the pedigrees had better than average yielding ability. NDB8 hybrids were tall with high ear placement, while A90 hybrids had low shelling percentages, and ND468 hybrids had low test weights.

The ranges in yield at Mandan were from 39.2 to 55.8 bushels per acre for the four-year period (Table 4). The same general conclusions regarding the inbreds apply in this experiment. ND468 as a parent tended to increase shelling percentages to a greater degree at this location.

Yields ranging from 70.8 to 85.5 bushels per acre were obtained at Larimore (Table 5). In general, there was more lodging at Larimore. Hybrids with CO303 in their pedigrees seemed to be more susceptible to both stalk and root lodging. Most of the trends mentioned for Fargo and Mandan also were evident at Larimore.

The later maturing single crosses ranged in yield from 69.9 to 84.4 bushels per acre at Fargo, 85.4 to 104.4 bushels per acre at Mooreton, and 89.5 to 104.2 bushels per acre at Sheldon (Tables 6, 7 and 8). In general, the yield trends for inbred performance in hybrid combinations were difficult to evaluate. The few hybrids containing ND405 and ND408 in their pedigrees yielded well. Hybrids with ND478, ND485, A556, ND484 and ND302 also seemed to yield above average for this group. Hybrids with ND478 in the pedigree appeared to be susceptible to stalk lodging, while hybrids with ND485 appeared to have more root lodging than average for this group.

Inbreds which appear to contribute to the shelling percentage of their hybrids are NDB8, ND309, ND405 and ND408. A90, ND363, and ND302 in hybrid combinations had below average shelling percentages. Hybrids containing ND302, ND474 and ND405 had above average test weights, while hybrids with NDB8 and ND481 had below average test weights for this group.

### Summary

Grain yields of experimental corn hybrids grown at five different sites in 1969, 1970, 1971 and 1972 are presented along with agronomic data obtained in 1971 and 1972. The hybrids consisted
(Continued on Page 32)

**Table 6. Agronomic Data for 24 Late Single-Cross Hybrids Grown at Fargo.**

| Hybrid | Pedigree | Ear Moisture % | Shelling % | Plant Ht. In. | Ear Ht. In. | Stalk Lodg. % | Root Lodg. % | Test Weight | Yield Bu/Acre |
|---|---|---|---|---|---|---|---|---|---|
| NDB186 | ND478 x ND405 | 35.4 | 82.6 | 79.1 | 37.7 | 5.9 | 1.8 | 59.7 | 84.8 |
| NDB187 | ND478 x ND408 | 40.0 | 82.6 | 81.8 | 41.4 | 13.4 | 0.0 | 57.9 | 84.7 |
| NDB712 | ND485 x ND474 | 35.8 | 82.8 | 68.8 | 33.8 | 0.0 | 5.6 | 59.3 | 83.1 |
| NDB676 | ND478 x NDB8 | 36.0 | 84.0 | 76.8 | 38.8 | 0.0 | 3.0 | 57.4 | 82.1 |
| NDB212 | ND485 x ND408 | 40.6 | 83.4 | 77.3 | 43.3 | 0.0 | 1.8 | 58.7 | 81.4 |
| NDB479 | CO303 x NDB8 | 33.1 | 84.2 | 76.8 | 37.8 | 1.1 | 7.0 | 57.0 | 81.4 |
| NDB213 | ND485 x ND480 | 37.6 | 80.3 | 77.4 | 41.5 | 1.0 | 6.6 | 59.0 | 81.0 |
| NDB199 | ND481 x ND480 | 38.8 | 79.5 | 79.6 | 43.6 | 2.8 | 2.8 | 56.7 | 80.0 |
| NDB714 | ND309 x A90 | 42.6 | 80.0 | 74.2 | 35.7 | 0.0 | 1.0 | 57.3 | 79.5 |
| NDB575 | ND474 x CO303 | 31.8 | 77.9 | 68.7 | 28.0 | 3.8 | 3.2 | 59.8 | 78.8 |
| NDB717 | ND302 x ND480 | 32.8 | 78.4 | 76.6 | 39.0 | 19.8 | 1.8 | 59.7 | 78.4 |
| NDB493 | CO303 x W673 | 32.4 | 81.3 | 71.2 | 34.4 | 6.0 | 5.5 | 59.4 | 78.2 |
| NDB142 | ND309 x NDB8 | 43.0 | 85.5 | 77.0 | 43.4 | 0.0 | 5.8 | 55.0 | 77.7 |
| NDB728 | ND484 x ND474 | 34.9 | 78.4 | 72.2 | 36.3 | 0.0 | 7.5 | 58.8 | 77.0 |
| NDB190 | ND481 x NDB8 | 38.4 | 81.6 | 75.8 | 40.2 | 0.0 | 2.0 | 56.8 | 76.4 |
| NDB724 | ND478 x ND480 | 37.9 | 76.0 | 82.2 | 43.0 | 17.3 | 2.8 | 58.6 | 76.4 |
| NDB679 | ND481 x A90 | 38.8 | 78.6 | 67.2 | 30.6 | 1.1 | 5.8 | 57.3 | 74.8 |
| NDB205 | ND484 x A556 | 39.1 | 81.2 | 71.0 | 34.4 | 2.2 | 9.9 | 58.5 | 74.6 |
| NDB408 | ND363 x A90 | 31.6 | 72.1 | 65.9 | 27.4 | 1.0 | 1.7 | 57.9 | 73.4 |
| NDB714 | ND302 x A90 | 34.1 | 76.0 | 69.2 | 29.0 | 0.0 | 6.9 | 61.1 | 73.2 |
| NDB573 | ND474 x W673 | 30.8 | 81.2 | 67.8 | 32.0 | 3.0 | 6.7 | 59.7 | 73.0 |
| NDB689 | ND485 x A90 | 35.6 | 79.9 | 64.4 | 31.3 | 0.0 | 4.2 | 58.2 | 72.7 |
| NDB727 | ND481 x A556 | 39.6 | 79.8 | 68.4 | 31.8 | 0.0 | 1.9 | 59.1 | 72.6 |
| NDB732 | ND302 x ND478 | 37.0 | 75.2 | 70.1 | 31.8 | 33.5 | 5.8 | 59.0 | 69.9 |

**Table 7. Agronomic Data for 20 Late Single-Cross Hybrids Grown at Mooreton.**

| Hybrid | Pedigree | Ear Moisture % | Shelling % | Plant Ht. In. | Ear Ht. In. | Stalk Lodg. % | Root Lodg. % | Test Weight Lb/Bu | Yield Bu/Acre |
|---|---|---|---|---|---|---|---|---|---|
| NDB689 | ND485 x A90 | 32.7 | 79.1 | 63.7 | 31.4 | 0.0 | 1.2 | 57.7 | 104.4 |
| NDB212 | ND485 x ND408 | 40.1 | 82.0 | 71.8 | 41.0 | 2.5 | 2.3 | 56.8 | 103.6 |
| NDB187 | ND478 x ND408 | 33.4 | 82.2 | 75.1 | 39.4 | 0.0 | 1.3 | 56.2 | 103.0 |
| NDB724 | ND478 x ND480 | 30.6 | 80.2 | 76.5 | 41.2 | 0.0 | 2.5 | 56.2 | 99.4 |
| NDB205 | ND484 x A556 | 37.3 | 80.6 | 67.5 | 31.6 | 1.4 | 0.0 | 57.3 | 99.1 |
| NDB134 | ND302 x NDB8 | 31.8 | 81.4 | 77.4 | 42.1 | 1.3 | 0.0 | 60.2 | 98.5 |
| NDB190 | ND481 x NDB8 | 32.7 | 79.9 | 73.9 | 40.0 | 1.3 | 0.0 | 55.4 | 98.2 |
| NDB676 | ND478 x NDB8 | 31.2 | 83.1 | 76.8 | 40.5 | 0.0 | 6.3 | 55.6 | 98.0 |
| NDB186 | ND478 x ND405 | 32.4 | 81.0 | 73.5 | 36.7 | 1.3 | 1.3 | 58.3 | 97.8 |
| NDB717 | ND302 x ND480 | 33.6 | 78.4 | 73.3 | 38.7 | 1.3 | 1.3 | 59.2 | 97.1 |
| NDB650 | ND309 x A90 | 38.3 | 79.7 | 70.2 | 34.8 | 0.0 | 2.5 | 56.0 | 96.0 |
| NDB714 | ND302 x A90 | 31.9 | 76.4 | 64.8 | 30.0 | 0.0 | 2.5 | 60.8 | 96.5 |
| NDB712 | ND485 x ND474 | 32.8 | 81.4 | 67.8 | 34.6 | 1.3 | 3.8 | 58.2 | 94.8 |
| NDB728 | ND484 x ND474 | 34.8 | 79.8 | 65.9 | 33.1 | 0.0 | 3.8 | 58.9 | 94.8 |
| NDB727 | ND481 x A556 | 33.6 | 80.0 | 65.6 | 30.6 | 0.0 | 0.0 | 57.4 | 93.4 |
| NDB189 | ND478 x ND474 | 31.0 | 80.2 | 67.3 | 30.3 | 0.0 | 1.4 | 58.2 | 92.3 |
| NDB213 | ND485 x ND480 | 38.9 | 79.4 | 71.8 | 41.0 | 2.5 | 2.3 | 56.7 | 91.4 |
| NDB142 | ND309 x NDB8 | 38.6 | 84.0 | 73.2 | 40.6 | 0.0 | 1.3 | 54.6 | 90.6 |
| NDB679 | ND481 x A90 | 31.0 | 74.8 | 62.8 | 30.3 | 2.6 | 7.9 | 54.5 | 86.8 |
| NDB199 | ND481 x ND480 | 37.7 | 77.0 | 72.4 | 40.9 | 1.3 | 2.4 | 53.9 | 85.4 |

**Table 8. Agronomic Data for 19 Late Single-Cross Hybrids Grown at Sheldon.**

| Hybrid | Pedigree | Ear Moisture % | Shelling % | Plant Ht. In. | Ear Ht. In. | Stalk Lodg. % | Root Lodg. % | Test Weight | Yield Bu/Acre |
|---|---|---|---|---|---|---|---|---|---|
| NDB212 | ND485 x ND408 | 35.8 | 83.7 | 74.8 | 40.2 | 2.5 | 16.4 | 58.8 | 104.2 |
| NDB205 | ND484 x A556 | 34.2 | 81.6 | 66.6 | 32.5 | 20.4 | 1.2 | 59.4 | 103.9 |
| NDB142 | ND309 x NDB8 | 36.4 | 86.2 | 70.4 | 36.2 | 8.0 | 1.0 | 55.6 | 102.6 |
| NDB186 | ND478 x ND405 | 28.2 | 83.0 | 73.0 | 35.8 | 49.7 | 1.2 | 59.6 | 102.0 |
| NDB187 | ND478 x ND408 | 31.6 | 83.2 | 77.6 | 38.7 | 43.6 | 3.4 | 58.0 | 100.8 |
| NDB728 | ND484 x ND474 | 30.9 | 81.8 | 66.0 | 32.3 | 16.0 | 4.7 | 59.8 | 100.7 |
| NDB727 | ND481 x A556 | 31.4 | 80.1 | 64.9 | 30.2 | 21.7 | 2.2 | 59.3 | 98.9 |
| NDB134 | ND302 x NDB8 | 29.6 | 82.8 | 72.2 | 37.4 | 20.8 | 5.2 | 61.2 | 97.5 |
| NDB717 | ND302 x ND480 | 24.6 | 77.6 | 72.5 | 36.4 | 43.6 | 5.5 | 58.5 | 97.4 |
| NDB213 | ND485 x ND480 | 30.8 | 82.6 | 71.0 | 37.2 | 9.8 | 10.0 | 59.3 | 97.2 |
| NDB199 | ND481 x ND480 | 32.0 | 80.6 | 73.9 | 39.8 | 39.7 | 1.2 | 56.8 | 96.8 |
| NDB189 | ND478 x ND474 | 25.4 | 83.0 | 68.0 | 32.2 | 36.2 | 3.8 | 58.5 | 96.6 |
| NDB724 | ND478 x ND480 | 30.9 | 85.2 | 77.1 | 38.8 | 40.8 | 0.0 | 57.5 | 96.0 |
| NDB676 | ND478 x NDB8 | 24.7 | 84.9 | 71.6 | 36.2 | 24.0 | 8.4 | 57.2 | 95.6 |
| NDB689 | ND485 x A90 | 30.4 | 79.3 | 62.0 | 30.4 | 4.8 | 12.8 | 58.7 | 95.4 |
| NDB190 | ND481 x NDB8 | 30.0 | 82.0 | 70.8 | 35.0 | 25.0 | 1.2 | 57.6 | 95.2 |
| NDB650 | ND309 x A90 | 38.5 | 80.8 | 67.4 | 31.6 | 6.0 | 2.5 | 58.9 | 94.9 |
| NDB712 | ND485 x ND474 | 27.0 | 83.2 | 65.6 | 32.0 | 20.7 | 6.6 | 59.8 | 94.4 |
| NDB679 | ND481 x A90 | 28.9 | 74.0 | 61.5 | 27.0 | 21.6 | 0.0 | 58.3 | 89.5 |

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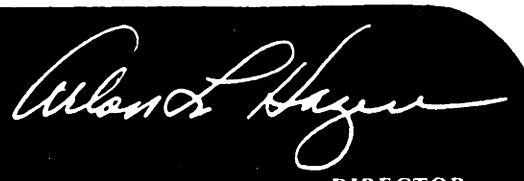

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AGR 101


R. L. WITZ AGR ENG

BULK THIRD-CLASS

(Hazen . . . from page 2)

penditures, or seek additional authorization as provided in the legislation.

Therefore, on March 20, 1974, the Budget Section of the Legislative Council received and considered a proposed increase in income expenditure authorization for the main station and seven branch stations. The current Budget Section of the Legislative Council is composed primarily of the members of the House and Senate Appropriations Committees from the 1973 Legislative Session, and Representative Robert F. Reimers is the Chairman of the Budget Section. Mr. Reimers also served as Chairman of the House Appropriations Committee during the 1973 Legislative Session.

The proposal for increase in income expenditure was developed on the basis of actual expenditures during the first seven months of the current biennium, or from July 1, 1973 through January 31, 1974. These estimates together with records of sales income during the same period provided validity to the request. The Budget Section of the Legislative Council considered the request very carefully and discussed the many facets of allowing the change during the interim period. Following deliberation, the Budget Section voted to approve the request as presented with one minor change.

The Budget Section of the Legislative Council is to be commended for taking this positive action as it will assist the agricultural research program, particularly at the several branch stations, to cope with the current financial problems. It is also very fortunate the existing legislation was originally designed and maintained to provide and allow this procedure to be taken when the situation becomes critical as it is at the present time.

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(Corn Hybrids . . . from page 30)

of two groups, an early group and a late group. For the four years, the early group averaged 80, 50 and 80 bushels per acre at Fargo, Mandan and Larimore, respectively, while the late group averaged 78, 96 and 98 bushels per acre at Fargo, Mooreton and Sheldon, respectively. The data presented should be of use to seedsmen and plant breeders interested in developing various types of hybrids adapted to North Dakota or areas with comparable environmental conditions, and of general interest to corn grain producers.

### References

1. Cross, H. Z., and H. D. Wilkins. 1974. **North Dakota Hybrid Corn Performance Testing, 1973.** Agronomy Circular 108, North Dakota State University.
2. Wiidakas, William. 1967. **Adapted Corn Hybrids are More Dependable.** North Dakota Farm Research 25(1):13-15.