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Corn Hybrids Compared
Michigan State University Extension Service
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Corn Hybrids Compared 1964

COOPERATIVE EXTENSION SERVICE
MICHIGAN STATE UNIVERSITY

By E. C. Rossman and Bary M. Darling

Hybrid corn trials are conducted each year by the Michigan Experiment Station in cooperation with the Cooperative Extension Service, Michigan Crop Improvement Association, seed corn companies, and farmers.

Many different hybrids are offered for sale in Michigan. They differ in yield ability, maturity, lodging resistance, and other characteristics. Yield and maturity averages of all testing locations in 1963 are as follows:

(1) Yield—the highest yielding hybrids averaged 30 bushels more than the lowest yielding hybrids and 14 bushels more than the average of all hybrids tested.

(2) Maturity—the earliest maturing hybrids were 14 percent drier in moisture content at harvest than the latest maturing hybrids and 7 percent drier than the average of all hybrids tested.

These differences show that choosing the best corn hybrids is an important corn production practice. Higher yields and other improvements from planting the best hybrids are obtained with no increase in production costs. Seed of the best hybrids generally costs no more than seed of hybrids with lower performance.

ENTRIES

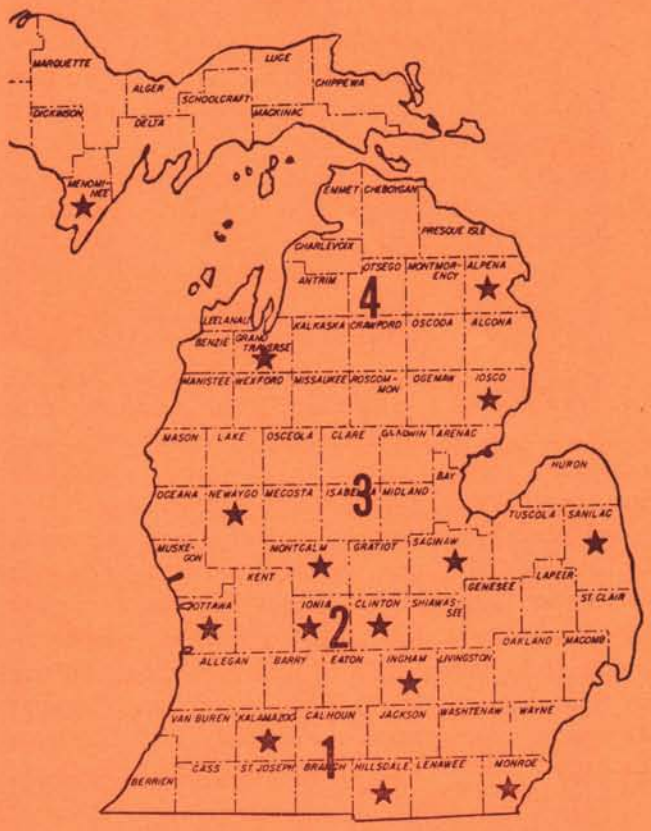
All seed companies are invited each year to enter their hybrids in the trials. A fee is charged to cover some of the direct expenses. A decline of 40 percent in voluntary entries by seed companies during 1961 and 1962 compared with the average for 1956-60 resulted in the situation where:

(1) several seed companies no longer entered any of their hybrids, and

(2) others entered primarily new and experimental hybrids.

Reduced voluntary participation by seed companies led to the addition of "extension entries" in the 1963 trials.

Extension entries were hybrids suggested by county extension directors after consulting with a sample of farmers. These were hybrids not entered by seed



companies. They were chosen largely on the basis that they were among the more widely planted in the various areas.

No distinction between, or identification of, voluntary entries by seed companies and extension entries is made in reporting the results. All hybrids were randomized and compared in the same field using the same procedure.

METHODS

Scientific procedures are followed in conducting these trials to give all hybrids equal opportunity to demonstrate their capabilities. The best way to compare a group of corn hybrids is to grow them in the same field with the same fertilizer, population, date of planting, etc., for all hybrids.

Seed for voluntary and extension entries was submitted by the seed companies. Equal numbers of seeds were counted for each plot of all hybrids. Each hybrid was replicated several times in the field. Plots were planted with a standard two-row or four-row corn planted adapted for small plots.

From seed packaging through harvest and data processing, each hybrid was identified only by a code number to reduce chance for any personal bias by anyone working in the field or with the data. The code was deciphered after the data had been processed.

Stands and lodging were counted before harvest. Plots were harvested with a one-row picker-sheller, except the Iosco and Menominee County trials which were hand harvested. Field data were processed with high speed IBM electronic computers.

Silage yields were taken on all hybrids in the Ingham, Grand Traverse, and Iosco County trials (Tables 7, 14, and 16).

All hybrids in the Monroe, Ingham, and Saginaw County trials were compared at two plant populations (Tables 1, 6, and 10).

HOW TO USE THIS BULLETIN

One and two-year averages are presented for all hybrids tested during 1962 and 1963. In previous editions, two and three-year averages were reported and one-year data were not included. **One-year data are less reliable than two or three-year averages.** Due to the decline in voluntary entries by seed companies in 1961 and 1962, there were only a few hybrids with three-year (1961-1963) averages. Therefore one-year data are included this year.

The trial at the M.S.U. Muck Experimental Farm in Clinton County in 1963 was abandoned because of severe frost damage on June 21 and 22. Bears destroyed the 1963 Menominee County trial. Two and three-year data (1960-62) for these two trials are included in Tables 8 and 17. New trials in Ionia and Montcalm Counties were started in 1963 so that only one-year data are available, Tables 5 and 11.

The tables tell you three things about the hybrids tested:

(1) average moisture content at harvest,

(2) average yield in bushels of shelled corn at 15.5 percent moisture, and

(3) average percentage of stalk lodging (plants broken below the ear at harvest).

Hybrids are recorded in the tables in order of their approximate maturity (early to late) based on moisture content at harvest. Moisture contents were determined from shelled grain samples at all locations except Tables 7, 14, 15, 16, and 17 which report moisture content based on ear corn samples.

Stalk breakage is caused by corn borers and/or stalk rot diseases.

Two or more plots of the same hybrid in the same field may produce somewhat different results due to uncontrolled variability in the soil and other environmental factors. Replication and randomization of the entires are two methods used to reduce these errors. Since these methods do not eliminate all of these effects, *differences necessary for statistical significance* have been calculated for yield and moisture content and are reported at the bottom of each table as "L.S.D." When comparing any two hybrids, the difference between them should not be considered significant unless it exceeds the "L.S.D." value stated at the end of the table.

Agronomic information for each trial is given at the bottom of the table. Fertilizer amounts are total pounds per acre of nitrogen, P_2O_5, and K_2O applied during the season.

Michigan experimental hybrids and some experimental hybrids from seed companies are not listed since seed is not yet available for farm use.

Single-cross hybrids are indicated with (2x) and three-way hybrids with (3x) following the hybrid name and number.

HOW TO CHOOSE A CORN HYBRID

Adaptation—The map on the cover shows location of the trials and divides Michigan into four maturity zones. A map can show maturity zones only in a general way. Local variations in weather, soil type and fertility, time of planting, and other conditions all affect adaptation. Corn hybrids are often adapted to more than one zone

Find the zone in which you plan to grow the corn, and refer to the table which gives results for the trial conducted nearest your farm. Also, refer to the other tables listed in your zone. A hybrid which

has done well at two or more locations is more likely to be a good hybrid for your farm, too.

Rate of planting—A population of 12,000 plants per acre is best for corn soils producing 50 bushels or less per acre. Populations of 16-17,000 are best for soils producing more than 50 bushels per acre. Higher populations, 20,000, should be considered only for soils consistently producing more than 100 bushels per acre. Rainfall deficiencies with high plant population usually result in no increase and frequently a decrease in yield compared to 16-17,000. Lodging and harvest losses are often greater at high populations.

Maturity—Hybrids are listed in the tables in order of maturity, early to late. One percent more moisture at harvest means a delay in maturity of about two days. Corn is mature when moisture is down to 35 percent in the grain or 40 percent in the ear. Ear corn is safe to crib when moisture content is below 25 percent.

For grain—It is better to choose an early corn (below average moisture content) than a late corn for grain. The tables show that a good yield does not depend on late maturity. Advantages of early maturing hybrids are:

(1) They usually mature before killing frosts.

(2) Good yielding early hybrids generally yield as much or more corn than late hybrids in most areas in Michigan.

(3) Lower moisture content at harvest permits safer storage. You will take more clean, sound, high-quality corn out of the crib.

(4) Mature, dry corn makes better livestock feed.

(5) You can harvest earlier in the fall when weather conditions are most favorable. Early harvest may reduce corn losses resulting from broken stalks and dropped ears in the field.

(6) Early hybrids with lower moisture content at harvest reduces cost for drying and market discount for moisture is less.

(7) Fall plowing of corn stubble may be possible with early hybrids on land not subject to erosion.

For silage—The best silage contains a high percentage of grain. Hybrids that produce high yields of grain should be used for silage. High dry weight production per acre is a better basis for choosing hybrids for silage than tons of green weight.

Corn for silage should reach the early dent stage well before frost in an average year. The early dent stage, when most of the kernels have dented, is the best time to begin harvest for silage. Dry matter production continues to increase until maturity.

Other considerations—Choose early hybrids for late plantings, low soil fertility, sandy soils, muck soils, and for corn which is to be followed by a winter grain or cover crop.

You can get some degree of "crop insurance" by choosing two or three hybrids which differ slightly in their maturity. If one hybrid runs into unfavorable weather at a critical stage of growth, another may be affected less and come through with a good crop.

Even though you have been growing a hybrid which has given good results, you may be able to improve your corn crop by trying one or more of the hybrids with better records in these trials. Well tested new hybrids are worth trying. You may want to try a new hybrid in a strip in the same field with your present hybrid.

SINGLE, THREE-WAY, AND DOUBLE CROSSES

Single-cross corn hybrids for farm grain production have been receiving increasing attention since 1960. Similar interest developed in three way hybrids somewhat earlier.

Single and three-way hybrids, as types of hybrids, are not new developments. They have been used in corn breeding research for many years to evaluate inbred parents and to produce seed for double-cross hybrids. (See the definitions of these and other terms below). Improvements in seed production techniques, advances in production practices for grain corn, and a better appreciation by farmers of the importance and value of better corn hybrids have stimulated interest in them for farm production of corn.

A comparison of single-cross and three-way hybrids with the more common double-cross hybrid type used by farmers for 25 to 30 years is presented here. This interpretation of current information and experience does not apply to all situations, such as unusually favorable environments, and it may change as research progresses.

When considering single-cross or three-way hybrids for farm production, some of their general characteristics, and their current performance records should be compared to the best double-cross hybrids now available.

DEFINITIONS

Inbred lines of corn—are true breeding (homozygous) parents for hybrid corn. They are developed by corn breeders using artificial self pollination (inbreeding) accompanied by vigorous selection for desired characteristics for five or more generations. With true-breeding inbred lines, the seed producer can duplicate the exact characteristics of a particular hybrid each time a seed crop is produced. Seed yields on inbred plants are low (10 to 40 bushels per acre) since inbreeding results in a marked decrease in vigor and productivity. Hybrid vigor (heterosis) occurs when two highly selected unrelated inbreds possessing desirable characteristics are crossed.

Single-cross hybrid—is a cross of two inbred lines. Designating two inbreds as *A* and *B*, a single-cross would be *(A x B)*.

Three-way hybrid—is a cross of single-cross hybrid, *(A x B)*, as the seed parent with an inbred line, *C*, as the pollen parent to give the pedigree, $[(A \times B) \times C]$.

Double-cross hybrid—is a cross of two different single crosses giving the pedigree $[(A \times B) \times (C \times D)]$. Four different unrelated inbred parents with desirable characteristics are brought together in the hybrid.

SINGLE-CROSS HYBRIDS

True single-cross seed is produced on inbred plants in a seed crossing field. Seed yields are low with a resultant increased cost of production. Seed quality (smaller seed, more round kernels, etc.) may not be as good as double-cross seed. Price ($18 to $25 per bushel) of single-cross seed is usually 50 to 100% higher than double-cross seed.

To overcome some of these disadvantages in seed production, many of the single-cross hybrids are "modified" single crosses. Two closely related sister inbred lines are crossed, $(A_1 \times A_2)$, to produce one parent that will be the seed or female parent in the hybrid. The pollen or male parent may be a cross of two different but closely related sister inbreds $(B_1 \times B_2)$ or a full inbred *B*. "Modified" single-cross seed for sale to farmers is then produced by crossing these two parents $[(A_1 \times A_2) \times (B_1 \times B_2)]$ or $[(A_1 \times A_2) \times B]$. Seed yields are higher since $(A_1 \times A_2)$ plants are somewhat more vigorous and produce better quality seed than full inbred *A* plants.

There are other procedures used to produce "modified" single crosses involving less-than-full inbreds as parents. All of these modifications in seed production techniques result in somewhat more genetic variability than a true single cross but less than a double cross.

In seed sales, the single-cross hybrid seed may not be identified, on the tag or bag, as to whether it is a true single cross, (A x B), or a "modified" single cross of some type. Most of the present seed laws do not permit labeling, as single-cross seed, seed produced by these modifications. Therefore, the seed tag usually does not refer to the seed as single-cross.

The following discussion applies to both types, true single crosses and modified single crosses. It assumes that the modified single cross will approach a true single cross, genetically, more than either a three-way or double-cross hybrid. Single-cross plants have full hybrid vigor when the two inbred parents are unrelated, possess high yield potentials, and other desired characteristics. Genetically, all of the plants of a single-cross hybrid are the same or very similar. Plants of a double-cross hybrid are more variable in most characteristics; they are not identical genetically. This characteristic of extreme uniformity is the basis for the advantages and disadvantages of single crosses.

ADVANTAGES OF SINGLE CROSSES

A corn field planted with single-cross seed is impressive because the plants are very uniform. Plant height, ear height, tasseling, silking, pollen shedding, and all other characteristics, desirable and undesirable, are extremely uniform. For those who judge corn hybrids on the basis of "looks" or eye appeal, single-cross hybrids will meet with high favor.

Genetic uniformity of single-cross plants may be advantageous to grain yields *if* the environment (weather, soil, cultural practices, etc.) is particularly favorable to this one genotype (genetic composition). With an environment conducive to high yield, the best single-cross hybrids might yield more than the best double crosses. If any component of the environment is adverse, it will affect equally all of the single-cross plants. Since only two inbred parents are involved, in a single cross hybrid, a higher level of resistance to diseases, insects, and other unfavorable situations could be developed by corn breeders.

DISADVANTAGES OF SINGLE CROSSES

Performance data, to date, in Michigan do not indicate any consistent superiority of single-cross hybrids over double-cross hybrids. In the tables, single-cross hybrids are indicated by (2X), three-way hybrids by (3X). The others are double crosses. The only fair way to evaluate yielding ability of single-crosses is to compare them with double crosses in the same field where all have similar growing conditions. Comparisons of yields from a single-cross with yields of double-crosses when they are in different fields can be very misleading. Such comparisons lead to the wrong conclusion due to differences in soil, weather, and cultural practices.

Pollen shedding will occur during a relatively shorter period, 3 to 4 days, in a single-cross field because all of the plants are genetically alike. A longer period (5 to 8 days) of pollen shedding will prevail in a double-cross field and a higher percentage of the silks may be fertilized giving more complete filling of the ear with grain, particularly the tips. Silks from the tip portion of the ear are the last to emerge. If there is little or no pollen present in the field when these last silks emerge, grain will not develop on the tip of the ears.

In yield trials involving a group of hybrids, a

single-cross may have an advantage of more complete ear filling than would occur when in a field by itself.

Some of the disadvantages of single-crosses (also, some of the advantages) can be reduced by planting two or more hybrids, differing slightly in maturity, in the same field to prolong the pollination period and increase the total variability in the field. Seed of different hybrids should not be mixed. Even though tagged as the same grade of seed, there usually will be some difference in seed size that may lead to a mechanical "grade-out" in the planter box. It is better to put seed of one hybrid in one or two seed hoppers of the planter and seed of another hybrid in the other one or two hoppers. This will give alternating two or four rows of each hybrid.

Yields from single crosses may be lower than those from double-crosses when moisture, plant food, etc. become limiting. Single-cross plants are similar genetically and, thus, they may be less "buffered" against an adverse environment than double-cross hybrids which are more variable in plant characteristics. When diseases or harmful insects are present, the damage could be greater with single crosses if the particular hybrid is susceptible.

Higher costs for single-cross seed can be a disadvantage if yields are not increased. If seed quality is lower, greater skill will be required in obtaining an optimum plant population.

THREE-WAY HYBRIDS

In a three-way hybrid, seed is produced on single-cross plants so that yield and quality may be equal, or nearly so, to double-cross seed. The pollinator is an inbred parent and this may add some to cost of seed production. Price of three-way seed is likely to be higher than double-cross seed but lower than single-cross seed.

Plants of three-way hybrids will be more variable than those of single-crosses and less variable than those of double-crosses. Advantages and disadvantages of three-way hybrids are likely to be between those already discussed for single-crosses and for double-crosses which follow.

Performance of three-way hybrids in Michigan trials, has not been consistently better than that for the better double-cross hybrids.

Three-way hybrids are generally used for commercial popcorn production since they produce more uniform quality (popping expansion, pericarp thickness, etc.) than a double-cross without unduly increasing seed production problems. Single-cross hybrids are commonly used for commercial sweet corn production since complete uniformity is desired for timely harvest and for uniform canning and table quality.

ADVANTAGES OF DOUBLE CROSSES

Double-cross plants are more variable than single or three-way crosses. They are not all alike genetically. Thus, the plants may be "buffered" more against unfavorable situations which frequently occur at one or more times during the growing season.

Performance data, to date, show that the best double-cross hybrids yield as much or more than single and three-way crosses on the average over the years and location of testing. Breeding and genetic research may eventually develop single or three-way hybrids that more consistently excel the best double-crosses.

A longer pollination period for double-crosses can provide more complete filling of the ear with grain and result in higher yields.

Lower seed cost is an obvious advantage where the yield of the double-crosses are equal or better than the best single or three-way hybrids. Better seed quality of double-cross seed, in general, may give more nearly optimum stands.

Double-cross pedigrees (four inbred lines) provide the corn breeder with an opportunity to bring more different desirable characteristics together into one hybrid.

DISADVANTAGES OF DOUBLE CROSSES

Fields of double-cross hybrids do not possess the "eye appeal" of single-cross hybrids. Plants and ears are more variable.

It may be more difficult to obtain a high level of disease and insect resistance.

Double-cross hybrids may not take as full advantage of a highly favorable environment as a well adapted single-cross.

CONCLUSIONS

Before deciding to plant single or three-way hybrids, remember that there is no "magic" associated with them. There are poor, good, and best single and three-way hybrids just as there are poor, good, and best double-cross hybrids.

Performance data (experiment station, seed companies, your own, etc.) in which single, three-way, and double-crosses have been compared competitively should be studied and interpreted. Then compare the possible advantages against the possible disadvantages.

Table 1 Zone 1

Southern Michigan

MONROE COUNTY TRIAL

One and Two Years—1962 and 1963

Hybrid	Moisture % 1963	Moisture % 2 years	Bushels per Acre 1963 16,200	Bushels per Acre 1963 21,100	Bushels per Acre 2 years	Stalk Lodging % 1963 16,200	Stalk Lodging % 1963 21,100	Stalk Lodging % 2 years
MICHIGAN 250	16	18	59	58	68	4	0	2
MICHIGAN 270	17	—	70	69	—	4	3	—
MICHIGAN 300	17	19	61	51	75	3	6	3
MICHIGAN 370	19	22	72	56	77	6	2	7
MICHIGAN 400	19	22	73	67	86	1	0	1
MICHIGAN 425	20	22	77	63	83	2	1	2
PIONEER 3558 (2X)	20	—	80	64	—	1	2	—
PIONEER 371	20	—	72	58	—	2	1	—
MICHIGAN 490	20	23	64	56	77	5	0	4
MICHIGAN 430	21	23	74	64	85	4	1	4
P.A.G. SX 49 (2X)	21	24	67	74	78	2	0	1
DeKALB 415A	21	—	71	54	—	2	4	—
MICHIGAN 570	21	24	85	70	94	6	5	5
GARNO 390	21	23	72	52	81	1	1	2
P.A.G. 234	22	—	71	59	—	1	2	—
KINGSCROST KM 579	22	—	76	72	—	0	1	—
SUPERCROST 437	22	24	64	59	81	7	2	4
DeKALB 427	22	25	72	66	91	1	1	1
P.A.G. 285	22	—	67	57	—	4	1	—
FUNK BROS. G32	22	—	71	71	—	1	2	—
KINGSCROST KT	23	—	67	47	—	0	0	—
PIONEER 3414	23	25	85	77	94	3	4	2
CARGILL 6123	23	—	75	51	—	2	0	—
UNITED HAGIE X138A (2X)	24	—	60	51	—	5	1	—
GARNO EXP. 61-80	24	—	69	49	—	0	1	—
PIONEER 342 B	24	—	69	72	—	1	1	—
SUPERCROST 490	24	28	54	44	71	2	0	1
GARNO S105 (2X)	24	27	69	47	82	1	1	1
SUPERCROST X34100	24	—	78	57	—	2	0	—
SUPERCROST X3630	24	—	73	45	—	2	3	—
SUPERCROST X2140	24	—	68	55	—	1	2	—
CARGILL 270	25	27	60	49	78	1	1	1
KINGSCROST KM589	25	—	85	60	—	2	2	—
SUPERCROST S6 (2X)	25	26	75	78	81	1	0	2
SUPERCROST X5900	25	—	91	74	—	0	3	—
SUPERCROST X3900 (2X)	25	—	63	62	—	1	3	—
MICHIGAN 620	25	27	81	59	94	1	0	1
UNITED HAGIE X3H39A (3X)	25	—	63	57	—	1	2	—
DeKALB 441A	25	—	67	57	—	3	0	—
FUNK BROS. G71	25	—	74	64	—	1	0	—
DeKALB 441	26	27	77	69	82	3	1	2
DeKALB XL-361 (3X)	26	28	68	66	88	2	0	1
PIONEER 325A	27	29	72	58	94	1	1	1
SUPERCROST S7 (2X)	29	—	86	58	—	3	2	—
PIONEER 3304 (2X)	33	—	68	58	—	0	1	—

Table 1 continued. Monroe County.

Southern Michigan

Hybrid	Moisture % 1963	Moisture % 2 years	Bushels per Acre 1963 16,200	Bushels per Acre 1963 21,100	Bushels per Acre 2 years	Stalk Lodging % 1963 16,200	Stalk Lodging % 1963 21,100	Stalk Lodging % 2 years
AVERAGE	23	24	72	62	84	2	2	2
RANGE	33 to 16	29 to 18	91 to 54	78 to 44	96 to 71	7 to 0	6 to 0	7 to 1
L.S.D.*	1	1	8	7	4			

*Least significant differences.

	1962	1963
Planted	May 5	May 9
Harvested	October 12	October 24
Soil type	Brookston loam	Brookston loam
Previous crop	Corn	Corn
Population	16,700	16,200 and 20,100
Fertilizer	118-72-36	128-108-201
Soil test: pH	6.6	6.0
P_2O_5	34 (medium)	44 (high)
K_2O	156 (medium)	138 (medium)

Farm Cooperator: Earl Creech, Dundee

County Extension Director: R. J. Laser, Monroe

Table 2 Zone 1

Southern Michigan

HILLSDALE COUNTY TRIAL

One and Two Years—1962 and 1963

Hybrid	Moisture % 1963	Moisture % 2 years	Bushels per acre 1963	Bushels per acre 2 years	Stalk Lodging % 1963	Stalk Lodging % 2 years
MICHIGAN 270	17	—	85	—	2	—
MICHIGAN 300	17	19	86	84	7	5
MICHIGAN 250	18	19	74	70	2	3
WYCKOFF SX W7 (2X)	19	—	97	—	2	—
MICHIGAN 370	20	22	91	87	3	3
MICHIGAN 400	20	23	100	96	4	3
MICHIGAN 425	21	24	93	87	1	2
DeKALB 239	21	—	87	—	7	—
BLANEY B400 (2X)	21	—	96	—	5	—
MICHIGAN 430	22	23	89	87	4	5
PIONEER 371	22	—	94	—	2	—
MICHIGAN 570	22	25	93	88	2	5
DeKALB 404A	22	—	90	—	4	—
P.A.G. SX 49 (2X)	22	24	91	86	4	6
TODD 303 (3X)	22	—	93	—	0	—
GARNO EXP. 56-76	23	—	88	—	3	—
TODD 228	23	25	84	78	4	3
KINGSCROST KT	23	—	92	—	3	—
WYCKOFF W9A	23	—	100	—	0	—
GARNO EXP. 61-80	23	—	82	—	6	—

Table 2 continued. Hillsdale County.

Southern Michigan

Hybrid	Moisture % 1963	Moisture % 2 years	Bushels per acre 1963	Bushels per acre 2 years	Stalk Lodging % 1963	Stalk Lodging % 2 years
DeKALB 427	24	27	99	95	2	2
P.A.G. 285	24	—	99	—	0	—
P.A.G. 234	24	—	98	—	6	—
PIONEER 3558 (2X)	24	—	98	—	4	—
KINGSCROST KO4	24	—	103	—	4	—
PIONEER 342B	24	27	91	95	4	4
DeKALB XL-45 (2X)	24	—	105	—	4	—
KINGSCROST KM 579	24	—	89	—	4	—
WYCKOFF W10A	24	—	89	—	7	—
TODD 252	24	27	92	85	7	7
FUNK BROS. G70	25	—	95	—	5	—
FUNK BROS. G34	25	—	81	—	4	—
WYCKOFF SX W11 (2X)	25	—	90	—	7	—
MICHIGAN 490	25	27	94	95	4	4
CARGILL S412 (2X)	25	28	90	89	2	2
PIONEER 3414	25	29	98	96	5	5
PIONEER 373	25	—	90	—	10	—
DeKALB 238	26	—	103	—	4	—
BLANEY B800 (2X)	27	27	94	93	5	5
MICHIGAN 620	27	29	101	94	1	3
GARNO S105 (3X)	27	—	93	—	5	—
TODD 453	27	29	95	86	4	3
DeKALB 441A	27	—	92	—	6	—
SUPERCROST S6 (2X)	27	29	97	94	4	4
DeKALB XL-361 (3X)	27	—	97	—	1	—
KINGSCROST KM 589	28	—	100	—	3	—
TODD 44R (2X)	28	30	97	82	2	4
DeKALB 441	28	31	89	88	2	2
PIONEER 325A	30	—	90	—	4	—
AVERAGE	24	26	94	90	4	4
RANGE	30 to 17	31 to 19	105 to 74	100 to 78	10 to 0	7 to 2
L.S.D.*	2	1	8	4		

*Least significant differences.

	1962	1963
Planted	May 15	May 2
Harvested	October 11	October 23
Soil type	Fox sandy loam	Fox sandy loam
Previous crop	Corn-4 years	Corn-5 years
Population	16,600	16,700
Fertilizer	77-68-34	119-75-75
Soil test: pH	6.4	6.5
P_2O_5	89 (high)	71 (high)
K_2O	124 (medium)	164 (high)

Farm Cooperator: Keith Brown, Jonesville

County Extension Director: A. T. Hall, Hillsdale

Table 3 Zone 1

Southern Michigan

KALAMAZOO COUNTY TRIAL

One and Two Years—1962 and 1963

Hybrid	Moisture % 1963	Moisture % 2 years	Bushels per acre 1963	Bushels per acre 2 years	Stalk Lodging % 1963	Stalk Lodging % 2 years
MICHIGAN 270	20	—	46	—	1	—
MICHIGAN 250	21	22	51	40	1	9
MICHIGAN 300	22	23	48	40	2	6
MICHIGAN 400	25	26	55	45	1	6
WYCKOFF SX W7 (2X)	25	—	53	—	0	—
MICHIGAN 370	25	26	53	42	1	7
MICHIGAN 425	26	27	52	40	1	5
KINGSCROST KO5	26	—	43	—	1	—
PIONEER 368	27	—	54	—	2	—
FUNK BROS. G32	28	—	54	—	1	—
MICHIGAN 570	28	28	45	43	4	11
MICHIGAN 430	28	28	51	40	0	6
MICHIGAN 490	28	30	54	44	2	7
FUNK BROS. G34	28	—	43	—	2	—
PIONEER 3558 (2X)	29	—	45	—	0	—
WYCKOFF SX W11 (2X)	29	—	51	—	1	—
DeKALB XL-45 (2X)	29	29	52	45	1	8
DeKALB 427	30	30	50	44	1	7
P.A.G. 285	30	30	42	43	0	4
PIONEER 371	30	—	49	—	2	—
P.A.G. SX 49 (2X)	30	30	46	34	1	5
KINGSCROST KT	30	—	43	—	3	—
WYCKOFF W9A	30	—	51	—	2	—
MICHIGAN 620	30	31	45	43	0	7
CARGILL 6123	30	—	45	—	1	—
GARNO EXP. 61-80	31	—	55	—	3	—
WYCKOFF W10A	31	—	54	—	1	—
DeKALB 423	31	—	46	—	0	—
GARNO EXP. 56-76	32	—	53	—	1	—
DeKALB 441A	32	—	56	—	1	—
CARGILL S412 (2X)	32	31	58	48	0	5
P.A.G. SX 9 (2X)	32	31	49	45	1	7
DeKALB 440	32	32	49	43	1	6
DeKALB XL-361 (3X)	32	—	57	—	1	—
KINGSCROST KM 589	32	—	44	—	2	—
PIONEER 362	32	—	45	—	2	—
DeKALB 441	33	33	45	42	1	6
FARMCRAFT 40	34	—	48	—	1	—
PIONEER 3414	34	32	51	46	1	7
GENETIC GIANT 4	34	—	47	—	1	—
AVERAGE	30	29	49	43	1	7
RANGE	35 to 20	33 to 22	58 to 38	51 to 34	4 to 0	11 to 4
L.S.D.*	2	1	6	3		

Table 3 continued. Kalamazoo County.

Southern Michigan

Hybrid	Moisture % 1963	Moisture % 2 years	Bushels per acre 1963	Bushels per acre 2 years	Stalk Lodging % 1963	Stalk Lodging % 2 years
*Least significant differences.						
	1962		1963			
Planted	May 14		May 17			
Harvested	October 9		October 19			
Soil type	Fox loam		Fox loam			
Previous crop	Corn-2 years		Corn-3 years			
Population	16,400		11,500			
Fertilizer	125-100-0		95-60-60			
Soil test: pH	6.8		6.8			
P_2O_5	47 (high)		53 (high)			
K_2O	120 (medium)		168 (high)			

Farm cooperators: Reese and Richard VanVrancken, Climax

County Extension Director: Vern Hinz, Kalamazoo

Table 4 Zone 2

South Central Michigan

OTTAWA COUNTY TRIAL

One and Two Years—1962 and 1963

Hybrid	Moisture % 1963	Moisture % 2 years	Bushels per acre 1963	Bushels per acre 2 years	Stalk Lodging % 1963	Stalk Lodging % 2 years
MICHIGAN 270	27	—	47	—	0	—
MICHIGAN 250	28	24	50	39	0	3
DeKALB 57	30	—	39	—	1	—
MICHIGAN 300	31	27	44	30	1	1
FUNK BROS. G17A	32	—	39	—	0	—
MICHIGAN 370	32	29	35	32	1	2
MICHIGAN 400	32	29	42	34	1	1
KINGSCROST KE 497	32	—	31	—	0	—
DeKALB 224	32	—	33	—	0	—
PIONEER 3675	32	—	24	—	1	—
FUNK BROS. G32	33	—	39	—	1	—
PIONEER 3775 (2X)	33	31	24	27	0	0
MICHIGAN 570	33	31	29	25	0	4
MICHIGAN 425	34	30	38	38	2	3
P.A.G. 62	34	31	36	26	0	0
MICHIGAN 430	34	31	30	30	0	2
DeKALB XL-325 (3X)	34	—	38	—	1	—
PIONEER 373	34	—	38	—	1	—
P.A.G. 234	34	—	26	—	0	—
DeKALB 427	34	—	43	—	1	—
DeKALB 238	34	—	29	—	2	—
PIONEER 3558 (2X)	34	—	26	—	0	—
P.A.G. 70	35	32	21	21	0	1
KINGSCROST PX 487 (3X)	35	—	25	—	4	—

Table 4 continued. Ottawa County.

South Central Michigan

Hybrid	Moisture % 1963	Moisture % 2 years	Bushels per acre 1963	Bushels per acre 2 years	Stalk Lodging % 1963	Stalk Lodging % 2 years
P.A.G. EXP. 15136 (2X)	35	—	39	—	0	—
P.A.G. SX 49 (2X)	35	33	37	26	0	0
MICHIGAN 490	35	32	43	29	1	1
KINGSCROST KM 558	36	—	18	—	1	—
PIONEER 352	36	—	30	—	2	—
KINGSCROST KO5	36	—	22	—	0	—
PIONEER 371	36	—	31	—	0	—
PIONEER 362	36	—	24	—	0	—
P.A.G. 285	36	33	22	28	0	0
MICHIGAN 620	37	35	29	24	0	0
DeKALB 441	39	—	37	—	1	—
AVERAGE	34	31	33	30	.7	1
RANGE	39 to 27	35 to 24	50 to 18	21 to 39	4 to 0	4 to 0
L.S.D.*	2	1	6	3		

*Least significant differences.

	1962	1963
Planted	May 19	May 16
Harvested	October 15	October 17
Previous crop	Corn-3 years	Corn-4 years
Population	16,100	16,500
Fertilizer	66-129-140	16-64-90
Soil test: pH	6.3	6.1
P_2O_5	37 (high)	46 (high)
K_2O	210 (high)	216 (high)

Farm Cooperators: Gerrit J. Buth & Sons, Coopersville

County Agricultural Agent: R. J. VanKlompenberg, Grand Haven

Table 5 Zone 2

South Central Michigan

IONIA COUNTY TRIAL

One Year—1963

Hybrid	Moisture %	Bushels Per Acre	Stalk Lodging %
MICHIGAN 250	25	85	0
MICHIGAN 270	26	92	0
MICHIGAN 300	27	87	1
MICHIGAN 400	29	94	2
PIONEER 383	30	79	1
DeKALB 224	30	88	2
WOLVERINE 66A	30	84	1
KINGSCROST PX 530 (3X)	31	66	0
MICHIGAN 430	31	88	0
MICHIGAN 370	31	93	1
FUNK BROS. G17A	31	94	1
CARGILL PI 710	31	86	0
GARNO 380	31	92	2
P.A.G. 57	31	94	0
KINGSCROST PX 487 (3X)	31	85	0

Table 5 continued. Ionia County.

South Central Michigan

Hybrid	Moisture %	Bushels Per Acre	Stalk Lodging %
DeKALB 57	32	85	1
PIONEER 385	32	89	2
KINGSCROST KS 5	32	75	1
PIONEER 3675	33	88	0
PIONEER 3775 (2X)	33	85	1
PIONEER 376	33	79	1
MICHIGAN 425	33	90	3
KINGSCROST KM558	33	73	0
MICHIGAN 570	33	89	2
MICHIGAN 490	33	76	1
DeKALB 409	33	84	0
KINGSCROST KE 497	33	81	0
GARNO 385	33	79	1
PIONEER 3558 (2X)	34	89	2
PIONEER 368	34	80	0
DeKALB XL-325 (3X)	35	84	1
GARNO EXP. 56-76	36	81	0
DeKALB 238	36	87	1
DeKALB 427	37	77	1
P.A.G. SX 49 (2X)	37	76	4
P.A.G. EXP. 15136 (2X)	37	81	0
AVERAGE	32	86	1
RANGE	37 to 25	100 to 66	4 to 0
L.S.D.*	2	10	0

*Least significant differences.

Planted—May 8
Soil type—Brookston-Conover loam
Population—16,400
Soil test: pH = 6.4, P_2O_5 = 26 (medium), K_2O = 172 (high)
Harvested—October 11
Previous crop—Corn
Fertilizer—Manured, 110-114-60

Farm Cooperator—Herb Crosby, Portland
County Extension Director—William Pryer, Ionia

Table 6 Zone 2

South Central Michigan

INGHAM COUNTY TRIAL

One and Two Years—1962 and 1963

Hybrid	Moisture %		Bushels per Acre			Stalk Lodging %		
	1963	2 years	1963 17,000	21,000	2 years	1963 17,000	21,000	2 years
BLANEY EXP. 6431	27	26	75	73	69	4	0	4
MICHIGAN 270	27	—	75	71	—	5	2	—
MICHIGAN 250	28	—	73	74	—	0	0	—
KINGSCROST KE 497	28	—	76	73	—	1	1	—
MICHIGAN 300	29	26	84	76	80	1	1	5

Table 6 continued. Ingham County.

South Central Michigan

Hybrid	Moisture %		Bushels per Acre			Stalk Lodging %		
	1963	2 years	1963 17,000	21,000	2 years	1963 17,000	21,000	2 years
KINGSCROST PX 487 (3X)	29	—	80	80	—	1	2	—
MICHIGAN 400	30	28	84	77	87	0	1	1
MICHIGAN 370	30	28	79	74	81	3	0	6
PIONEER 368A	31	30	87	79	90	1	2	6
UNITED HAGIE 129A	31	—	91	76	—	1	0	—
FUNK BROS. G17A	31	—	75	80	—	0	1	—
GARNO 385	31	—	77	75	—	0	1	—
DeKALB XL-325 (3X)	32	—	79	81	—	0	0	—
GARNO EXP. 56-76	32	—	79	79	—	1	1	—
BLANEY B46	32	—	70	59	—	0	1	—
PIONEER 3675	32	—	75	77	—	1	1	—
SUPERCROST 209	32	—	72	72	—	0	1	—
KINGSCROST K05	32	—	81	72	—	2	2	—
PIONEER 371	32	—	78	72	—	1	1	—
DeKALB 224	32	—	82	75	—	3	1	—
KINGSCROST PX 530 (3X)	32	—	85	82	—	1	2	—
MICHIGAN 425	32	30	86	85	85	1	3	7
MICHIGAN 430	32	29	85	79	81	1	0	6
SUPERCROST X2610	32	—	84	71	—	3	1	—
SUPERCROST 31A	32	—	78	73	—	1	1	—
PIONEER 373	32	—	78	71	—	3	1	—
PIONEER 3775 (2X)	32	30	82	79	89	0	1	4
KINGSCROST KT	32	—	76	73	—	0	2	—
CARGILL 180	32	30	91	86	92	0	0	6
UNITED HAGIE 129B	32	—	84	81	—	0	0	—
DeKALB 427	32	—	72	73	—	0	1	—
PIONEER 352	32	—	86	82	—	0	2	—
GARNO EXP. 61-80	32	—	74	56	—	0	1	—
KINGSCROST KM 558	32	—	87	75	—	1	0	—
SUPERCROST X1200	33	—	89	81	—	0	1	—
BLANEY B400 (2X)	33	—	84	73	—	1	1	—
MICHIGAN 620	33	32	86	86	86	1	1	6
SUPERCROST X2570	33	—	83	79	—	1	1	—
CARGILL 6218 (2X)	33	—	82	70	—	0	1	—
P.A.G. 234	33	—	88	79	—	0	1	—
MICHIGAN 490	33	32	74	75	77	0	1	7
DeKALB 414	34	—	86	88	—	1	1	—
MICHIGAN 570	34	31	87	85	89	0	2	9
DeKALB XL-345 (3X)	34	33	71	72	75	1	0	3
DeKALB 238	34	32	78	73	78	0	1	6
PIONEER 3558 (2X)	35	—	71	71	—	0	0	—
DeKALB 441	38	—	72	75	—	1	0	—

Table 6 continued. Ingham County.

South Central Michigan

Hybrid	Moisture % 1963	Moisture % 2 years	Bushels per Acre 1963 16,200	Bushels per Acre 1963 21,100	Bushels per Acre 2 years 16,200	Bushels per Acre 2 years 21,100	Stalk Lodging % 1963	Stalk Lodging % 2 years
AVERAGE	32	30	81	76	84		1	1	5
RANGE	38 to 27	33 to 26	94 to 65	93 to 56	90 to 75		5 to 0	3 to 0	9 to 1
L.S.D.*	2	1	8	8	4				

*Least significant differences.

	1963	1962
Planted	May 3	May 8
Harvested	October 9	October 1
Soil type	Conover clay loam	Conover clay loam
Previous crop	Corn	Corn
Population	17,000 and 21,000	16,900
Fertilizer	17,000 = 123-89-156 21,000 = 239-149-181	103-89-156
Soil test: pH	6.1	6.6
P_2O_5	46 (high)	50 (high)
K_2O	236 (high)	144 (medium)

Farm Cooperator: Michigan State University, East Lansing, Michigan

Table 7 Zone 2

South Central Michigan

INGHAM COUNTY TRIAL

Silage—One Year—1963

Hybrid	Moisture % Ears	Moisture % Stalks	Tons per Acre Green weight	Tons per Acre Dry weight	Tons per Acre Ears-dry weight	% ears in dry weight
MICHIGAN 270	41	74	11.2	4.1	2.2	54
MICHIGAN 250	43	76	12.9	4.3	2.2	51
BLANEY EXP. 6431	44	75	7.7	2.9	1.8	62
MICHIGAN 300	44	74	12.5	4.5	2.4	53
BLANEY B46	44	75	11.6	3.9	1.8	46
KINGSCROST PX 487 (3X)	47	76	9.1	3.4	2.2	65
SUPERCROST 31A	47	77	11.3	4.0	2.4	60
MICHIGAN 400	48	78	13.2	4.3	2.4	56
DeKALB XL-325 (3X)	48	78	12.1	4.1	2.4	59
FUNK BROS. G17A	48	77	11.5	4.0	2.4	60
DeKALB 224	49	75	11.9	4.1	2.3	56
KINGSCROST KE 497	49	76	11.7	3.6	1.9	53
KINGSCROST PX 530 (3X)	49	76	11.7	4.2	2.5	60
GARNO 385	50	76	10.5	3.5	2.0	57
SUPERCROST X2570	50	75	13.3	4.6	2.5	54
BLANEY B400 (2X)	50	78	11.8	4.0	2.5	63
CARGILL 180	50	79	13.1	4.2	2.4	57
MICHIGAN 370	50	75	11.1	4.1	2.4	59
P.A.G. 234	50	77	15.8	5.0	2.6	52
KINGSCROST KM 558	51	78	11.9	3.9	2.3	59

Table 7 continued. Ingham County Silage Yields.

South Central Michigan

Hybrid	Moisture % Ears	Moisture % Stalks	Tons per Acre Green weight	Tons per Acre Dry weight	Tons per Acre Ears-dry weight	% ears in dry weight
MICHIGAN 570	51	77	13.7	4.5	2.6	58
SUPERCROST X2610	51	76	11.1	3.8	2.2	58
PIONEER 368A	51	78	13.2	4.4	2.7	61
DeKALB XL-345 (3X)	51	76	13.6	4.5	2.5	56
MICHIGAN 430	51	75	12.8	4.4	2.4	55
MICHIGAN 425	52	78	14.5	4.6	2.5	54
PIONEER 3675	52	72	11.3	4.0	2.1	53
PIONEER 352	52	79	15.0	4.6	2.7	59
UNITED-HAGIE 129B	52	80	11.9	3.4	1.7	50
MICHIGAN 490	53	74	12.8	4.4	2.4	55
KINGSCROST KO5	53	77	13.7	4.4	2.4	55
KINGSCROST KT	53	78	12.6	3.9	2.0	51
CARGILL 6218 (2X)	53	78	13.2	4.1	2.2	54
PIONEER 3775 (2X)	54	75	12.9	4.3	2.4	56
DeKALB 238	54	77	14.3	4.6	2.6	57
SUPERCROST X1200	55	78	13.0	3.9	2.0	51
DeKALB 427	55	79	13.0	4.0	2.3	58
UNITED-HAGIE 129A	55	78	14.0	4.1	2.1	51
SUPERCROST 209	55	76	15.5	4.8	2.4	50
PIONEER 373	56	77	13.8	4.1	1.9	46
PIONEER 371	56	74	12.5	4.2	2.3	55
MICHIGAN 620	56	77	13.5	4.2	2.3	55
GARNO EXP. 61-80	57	81	14.8	3.9	2.0	51
DeKALB 414	58	78	14.2	4.1	2.0	49
GARNO EXP. 56-76	58	77	12.3	3.6	1.7	47
PIONEER 3558 (2X)	58	77	15.5	4.6	2.3	50
DeKALB 441	59	77	14.2	4.1	1.9	46
AVERAGE	51	77	12.7	4.1	2.2	54
RANGE	59 to 41	81 to 72	15.8 to 7.7	5.4 to 2.9	3.1 to 1.6	65 to 45
L.S.D.*	2	3	1.1	.4	.3	

*Least significant differences.

Planted: May 3

Soil type: Conover clay loam

Population: 17,000

Soil test: pH = 6.1, P_2O_5 = 46 (high), K_2O = 236 (high)

Harvested: September 13

Previous crop: Corn

Fertilizer: 123-89-156

Farm Cooperator: Michigan State University, East Lansing, Michigan

Table 8 Zone 2

South Central Michigan

(MUCK SOIL) CLINTON COUNTY TRIAL

Two and Three Years—1960, 1961, and 1962

Hybrid	Moisture %		Bushels per acre		Stalk Lodging %	
	2 years	3 years	2 years	3 years	2 years	3 years
A.E.S. 202	28	26	49	52	5	8
MICHIGAN 250	29	27	57	60	5	5
MICHIGAN 300	30	28	57	61	4	4
CARGILL 655	32	30	59	58	12	12
MICHIGAN 370	33	31	56	61	4	3
PIONEER 381A	34	—	62	—	3	—
MICHIGAN 425	36	33	59	62	2	3
DeKALB 238	36	34	59	60	3	3
MICHIGAN 430	37	34	53	59	6	4
MICHIGAN 490	38	36	54	58	3	4
PIONEER 354A	38	35	62	65	5	4
AVERAGES	34	31	57	60	5	5

Planting Dates: May 26, 1960; May 24, 1961; May 22, 1962.
Harvest Dates: October 17, 1960; October 9, 1961; October 3, 1962.
Plant Populations: 2 years (1961-62) 16,500; 3 years (1960-62) 16,900.

Cooperators: L. N. Shepherd and R. M. Gillespie, Soil Science Department, Michigan State University, East Lansing.

Table 9 Zone 3

North Central Michigan

SANILAC COUNTY TRIAL

One and Two Years—1962 and 1963

Hybrid	Moisture %		Bushels per acre		Stalk Lodging %	
	1963	2 years	1963	2 years	1963	2 years
A.E.S. 202	26	26	64	72	0	2
KINGSCROST KC3	28	—	65	—	0	—
MICHIGAN 270	29	30	96	100	2	2
MICHIGAN 250	29	29	83	88	0	0
KINGSCROST KE 449	30	—	78	—	1	—
MICHIGAN 300	31	30	82	87	0	1
WOLVERINE 46A	32	—	84	—	0	—
KINGSCROST KE 471	33	—	88	—	1	—
MICHIGAN 400	33	32	88	103	0	0
KINGSCROST KE475	33	—	90	—	0	—
MICHIGAN 370	33	34	85	85	1	1
FUNK BROS. G11A	34	—	88	—	0	—
GARNO EXP. 60-55	34	—	68	—	0	—
PIONEER 388	34	—	91	—	0	—
KINGSCROST PX 481 (3X)	35	—	72	—	0	—

Table 9 continued. Sanilac County.

North Central Michigan

Hybrid	Moisture %		Bushels per acre		Stalk Lodging %	
	1963	2 years	1963	2 years	1963	2 years
JACQUES 901J	35	—	78	—	0	—
CARGILL 577	35	—	79	—	0	—
KINGSCROST PX 487 (3X)	35	—	89	—	1	—
MICHIGAN 425	35	34	90	96	1	3
DeKALB 61	35	33	74	91	1	0
GARNO 380	36	35	89	98	1	2
MICHIGAN 430	36	35	81	89	1	4
PIONEER 3558 (2X)	36	—	83	—	0	—
P.A.G. 45	36	—	88	—	1	—
FUNK BROS. G10A	36	—	86	—	0	—
PIONEER 3675	37	—	77	—	0	—
PIONEER 381A	37	—	79	—	0	—
GARNO 385	37	—	77	—	1	—
DeKALB 57	38	36	88	105	0	1
MICHIGAN 490	38	36	79	94	1	2
KINGSCROST KS4	38	—	77	—	0	—
DeKALB 238	38	37	79	100	0	0
KINGSCROST KE 497	38	—	88	—	0	—
MICHIGAN 570	39	37	85	102	1	2
DeKALB XL-325 (3X)	39	—	86	—	1	—
PIONEER 373	40	—	71	—	0	—
PIONEER 368A	40	38	84	101	0	1
SUPERCROST 214	40	37	81	100	0	2
DeKALB 224	41	—	83	—	0	—
P.A.G. EXP. 15136 (2X)	41	—	75	—	0	—
AVERAGE	35	34	78	95	.3	1
RANGE	41 to 26	40 to 26	96 to 64	105 to 72	2 to 0	4 to 0
L.S.D.*	2	1	9	4		

*Least significant differences.

	1963	1962
Planted	May 14	May 17
Harvested	October 21	October 26
Soil type	Brookston clay loam	Brookston clay loam
Previous crop	Corn	Corn
Population	17,000	16,700
Fertilizer	110-80-80	26-104-104
Soil test: pH	7.2	6.6
P_2O_5	8 (low)	18 (low)
K_2O	60 (low)	108 (medium)

Farm Cooperator: Orville Orchard, Applegate
County Extension Director: Keith Sowerby, Sandusky

Table 10 Zone 3

North Central Michigan

SAGINAW COUNTY TRIALS

One and Two Years—1962 and 1963

Hybrid	Moisture %		Bushels per Acre			Stalk Lodging %		
		2		1963	2		1963	2
	1963	years	16,100	20,200	years	16,100	20,200	years
MICHIGAN 270	22	—	83	79	—	1	2	—
DeKALB XL-304 (3X)	24	—	91	79	—	5	5	—
MICHIGAN 250	24	23	77	86	83	0	1	4
KINGSCROST KE 449	26	—	88	78	—	8	10	—
KINGSCROST KE 471	27	—	83	73	—	3	3	—
MICHIGAN 300	27	26	87	89	96	0	0	1
DeKALB 61	28	28	101	96	100	0	4	0
PIONEER 368	28	—	89	78	—	0	7	—
MICHIGAN 425	28	29	97	103	103	0	2	0
MICHIGAN 430	28	30	94	88	97	2	2	2
DeKALB 57	28	—	105	100	—	0	1	—
PIONEER 381A	28	—	92	95	—	0	3	—
DeKALB 62	29	—	81	80	—	8	1	—
KINGSCROST KE 475	29	—	99	87	—	0	3	—
MICHIGAN 400	30	30	88	95	101	0	5	0
P.A.G. EXP. 15136	30	—	92	80	—	0	1	—
DeKALB XL-15 (2X)	30	—	98	101	—	1	6	—
DeKALB 63	30	—	78	83	—	1	4	—
UNITED HAGIE X123 (2X)	30	—	109	90	—	0	1	—
MICHIGAN 370	30	31	100	103	99	1	0	1
P.A.G. 55	31	—	88	96	—	0	2	—
CARGILL 666	31	32	97	78	98	0	0	0
KINGSCROST 547	31	—	87	90	—	4	1	—
PIONEER 371	31	—	98	84	—	2	1	—
KINGSCROST PX 481 (3X)	31	—	89	81	—	1	6	—
KINGSCROST KE 497	31	—	98	86	—	0	3	—
PIONEER 3675	32	—	87	77	—	1	0	—
MICHIGAN 570	32	32	96	90	100	2	2	2
PIONEER 362	32	—	91	93	—	1	1	—
DeKALB 224	32	—	85	78	—	1	0	—
KINGSCROST 581	32	—	90	92	—	3	8	—
FUNK BROS. G32	33	—	96	88	—	0	1	—
GARNO 380	33	30	90	92	92	2	0	1
GARNO 385	33	—	81	79	—	0	2	—
KINGSCROST PX 487 (3X)	33	—	88	90	—	1	8	—
KINGSCROST K04	34	—	82	77	—	1	1	—
MICHIGAN 490	34	34	91	84	94	1	2	0
SUPERCROST X34100	35	—	92	88	—	1	3	—
DeKALB 238	35	—	87	75	—	0	0	—
GARNO EXP. 56-76	35	—	80	68	—	3	7	—

Table 10 Continued. Saginaw County.

North Central Michigan

Hybrid	Moisture %		Bushels per Acre			Stalk Lodging %		
		2		1963	2		1963	2
	1963	years	16,100	20,200	years	16,100	20,200	years
SUPERCROST 32	36	31	80	80	92	0	0	2
MICHIGAN 620	36	36	92	86	95	1	1	0
PIONEER 3558 (2X)	36	—	90	97	—	0	1	—
AVERAGE	31	31	92	88	98	4	8	1
RANGE	36 to 22	36 to 23	110 to 77	107 to 68	105 to 83	8 to 0	10 to 0	4 to 0
L.S.D.*	2	1	10	10	4			

*Least significant differences.

	1962	1963
Planted	May 4	May 12
Harvested	October 15	October 5
Soil type	Brookston clay loam	Brookston clay loam
Previous crop	Beans	Corn
Population	16,100 and 20,200	15,000
Fertilizer	76-79-40	99-72-36
Soil test: pH	6.9	7.1
P_2O_5	24 (medium)	18 (low)
K_2O	192 (high)	312 (very high)

Farm Cooperators: Walter Reinbold & Sons, Reese
County Agricultural Agent: Ray Vasold, Saginaw

Table 11 Zone 3

North Central Michigan

MONTCALM COUNTY TRIAL

One Year—1963

Hybrid	Moisture %	Bushels per Acre	Stalk Lodging %
MICHIGAN 270	29	83	2
MICHIGAN 250	29	78	2
MICHIGAN 300	30	80	3
DeKALB 56	31	72	1
FUNK BROS. G10A	33	83	1
MICHIGAN 370	34	84	3
KINGSCROST PX 530 (3X)	34	66	6
DeKALB 59	34	67	3
MICHIGAN 400	34	77	1
MICHIGAN 425	34	72	2
KINGSCROST KS5	34	72	1
MICHIGAN 430	34	72	0
KINGSCROST KM 558	35	77	0
PIONEER 383	35	66	5
KINGSCROST PX 487 (3X)	35	83	1
FUNK BROS. G14A	35	69	0
GARNO 380	35	71	0
MICHIGAN 490	35	74	1
PIONEER 388	35	71	18
GARNO EXP. 56-76	35	71	1

Table 11 continued. Montcalm County.

North Central Michigan

Hybrid	Moisture %	Bushels per Acre	Stalk Lodging %
GARNO 385	36	65	0
DeKALB 58	36	69	10
DeKALB 224	36	73	2
P.A.G. 57	36	74	0
KINGSCROST KE 497	36	74	1
MICHIGAN 570	37	73	1
DeKALB XL-325 (3X)	37	82	1
PIONEER 3775 (2X)	37	74	0
PIONEER 3675	38	75	0
DeKALB 57	38	73	2
DeKALB 238	38	73	1
FUNK BROS. G17A	38	85	1
CARGILL PI 710	38	79	1
PIONEER 368	39	87	1
PIONEER 3558 (2X)	39	81	0
P.A.G. EXP. 15136 (2X)	40	73	1
P.A.G. SX 49 (2X)	40	80	2
AVERAGE	35	75	2
RANGE	40 to 29	87 to 65	18 to 0
L.S.D.*	2	8	

*Least significant differences.

Planted—May 6
Soil type—Montcalm-McBride sandy loam
Population—16,700
Soil test: pH = 6.7, P_2O_5 = 165 (high), K_2O = 204 (high)
Harvested—October 14
Previous crop—beans
Fertilizer—118-70-70
Farm Cooperators—Henry and Kenneth Daniels, McBride
County Extension—James Crosby and Victor Beal, Stanton

Table 12 Zone 3

North Central Michigan

NEWAYGO COUNTY TRIAL
One and Two Years—1962 and 1963

Hybrid	Moisture %		Bushels per acre		Stalk Lodging %	
	1963	2 years	1963	2 years	1963	2 years
A.E.S. 202	23	23	57	52	4	2
MICHIGAN 270	24	25	71	65	3	2
MICHIGAN 250	25	24	67	61	1	2
KINGSCROST KE 475	25	—	56	—	0	—
FUNK BROS. G11A	26	—	65	—	0	—
P.A.G. 38	27	26	57	56	0	3
HAAPALA 366A	27	—	62	—	2	—
MICHIGAN 300	27	33	67	60	0	3
MICHIGAN 370	27	28	67	62	0	2
PIONEER 385	27	—	70	—	0	—
PIONEER 3675	28	—	69	—	1	—
DeKALB 59	28	—	71	—	1	—
KINGSCROST KE 449	28	—	56	—	3	—
KINGSCROST PX 487 (3X)	28	—	57	—	2	—
DeKALB XL-304 (3X)	28	—	58	—	2	—

Table 12 continued. Newaygo County.

North Central Michigan

Hybrid	Moisture %		Bushels per acre		Stalk Lodging %	
	1963	2 years	1963	2 years	1963	2 years
KINGSCROST KE 471	28	—	72	—	2	—
DeKALB 57	28	28	64	60	0	2
KINGSCROST PX 481 (3X)	28	—	70	—	2	—
DeKALB C15	28	28	66	66	1	3
FUNK BROS. G10A	28	—	63	—	2	—
MICHIGAN 400	29	29	72	67	0	1
DeKALB 58	29	—	53	—	3	—
KINGSCROST KE 497	29	—	59	—	1	—
P.A.G. 62	30	29	67	59	1	4
FUNK BROS. G17A	30	—	67	—	0	—
MICHIGAN 430	30	30	67	61	5	4
P.A.G. 55	30	—	67	—	0	—
P.A.G. 70	30	32	57	58	2	1
HAAPALA 135A	30	—	53	—	1	—
PIONEER 383	30	—	62	—	0	—
MICHIGAN 425	30	31	76	67	0	1
DeKALB XL-325 (3X)	31	—	75	—	0	—
P.A.G. 45	31	30	75	64	1	2
P.A.G. SX 49 (2X)	32	32	68	63	0	1
DeKALB 251	33	32	65	60	1	4
PIONEER 368	33	32	53	58	1	3
PIONEER 3558 (2X)	33	—	65	—	0	—
MICHIGAN 490	34	—	67	—	1	—
PIONEER 354A	34	—	67	—	2	—
P.A.G. EXP. 15136 (2X)	35	—	68	—	0	—
DeKALB 238	35	33	63	64	0	1
AVERAGE	29	29	64	61	1	2
RANGE	35 to 23	34 to 23	80 to 50	67 to 52	5 to 0	4 to 0
L.S.D.*	2	1	7	4		

*Least significant differences.

	1962	1963
Planted	May 7	May 18
Harvested	October 26	October 19
Soil type	McBride sandy loam	McBride sandy loam
Previous crop	Wheat seeded to clover	Wheat seeded to clover
Population	14,400	15,200
Fertilizer	110-150-108	32-132-50
Soil test: pH	6.8	6.8
P_2O_5	41 (high)	68 (high)
K_2O	140 (medium)	168 (medium)

Farm Cooperator: Merrill Eady, Grant

County Extension Director: Clare Musgrove, Fremont

Table 13 Zone 4

Northern Michigan

GRAND TRAVERSE COUNTY TRIAL

One and Two Years—1962 and 1963

Hybrid	Moisture % 1963	Moisture % 2 years	Bushels per acre 1963	Bushels per acre 2 years	Stalk Lodging % 1963	Stalk Lodging % 2 years
MICHIGAN 160	17	23	36	49	3	3
DeKALB 29	18	—	48	—	3	—
A.E.S. 202	18	25	44	58	0	3
DeKALB 36	18	26	42	60	2	3
FUNK BROS. G188	19	—	42	—	2	—
KINGSCROST KE 435	20	—	33	—	3	—
MICHIGAN 270	20	27	53	67	2	2
MICHIGAN 250	20	27	47	62	1	2
DeKALB 45	20	28	45	53	1	2
KINGSCROST KC3	21	—	30	—	5	—
FUNK BROS. G11A	21	—	43	—	2	—
DeKALB 45A	21	—	45	—	1	—
DeKALB 56	22	—	28	—	0	—
MICHIGAN 300	23	29	43	58	0	5
MICHIGAN 370	23	31	49	64	0	2
DeKALB 59	26	—	40	—	0	—
DeKALB XL-15 (2X)	27	—	44	—	1	—
AVERAGE	21	27	42	59	1	2
RANGE	27 to 17	23 to 31	53 to 28	67 to 49	5 to 0	5 to 0
L.S.D.*	1	1	5	3		

*Least significant differences.

	1962	1963
Planted	May 18	May 21
Harvested	October 29	October 18
Soil type	Emmett sandy loam	Emmett sandy loam
Previous crop	Alfalfa	Corn
Population	16,100	16,170
Fertilizer	10-40-40	79-48-48
Soil test: pH	6.0	6.3
P_2O_5	30 (medium)	35 (medium)
K_2O	88 (low)	112 (medium)

Farm Cooperators: Herb and Carl Wagner, Grawn

County Extension Director: A. W. Glidden, Traverse City

Table 14 Zone 4

Northern Michigan

GRAND TRAVERSE COUNTY TRIAL

Silage—One Year—1963

Hybrid	Moisture % Ears	Moisture % Stalks	Tons per Acre Green weight	Tons per Acre Dry weight	Tons per Acre Ears-dry weight	% ears in dry weight
MICHIGAN 160	41	75	8.1	2.9	1.6	55
KINGSCROST KE 435	43	71	8.7	3.4	1.8	53
DeKALB 29	44	76	7.4	2.7	1.6	59
DeKALB 36	44	73	6.5	2.5	1.5	60
FUNK BROS. G188	44	77	8.1	3.6	1.7	44
A.E.S. 202	45	73	9.0	3.5	2.0	57
KINGSCROST KC3	45	75	7.1	2.6	1.6	62
DeKALB 45A	48	77	7.8	2.5	1.3	52
MICHIGAN 250	48	76	9.7	3.3	1.8	55
MICHIGAN 270	49	77	9.8	3.1	1.7	55

Table 14 continued. Grand Traverse County Silage Yields.

Northern Michigan

Hybrid	Moisture % Ears	Moisture % Stalks	Tons per Acre Green weight	Tons per Acre Dry weight	Tons per Acre Ears-dry weight	% ears in dry weight
DeKALB 45	49	77	8.6	2.8	1.5	54
FUNK BROS. G11A	51	78	9.8	3.0	1.5	50
DeKALB 56	51	75	9.6	3.2	1.6	50
MICHIGAN 300	52	76	11.1	3.3	1.4	42
MICHIGAN 370	52	77	9.0	2.8	1.4	50
DeKALB 59	54	76	10.3	3.2	1.4	44
DeKALB XL-15 (2X)	57	78	11.1	3.2	1.5	47
AVERAGE	48	76	9.0	3.0	1.5	50
RANGE	57 to 41	78 to 71	11.7 to 6.5	3.6 to 2.5	2.0 to 1.3	to
L.S.D.*	3	2	1.1	.4	.3	

*Least significant differences.

Planted: May 18

Soil type: Emmett sandy loam

Fertilizer: 10-40-40

Soil test: pH = 6.0, P_2O_5 = 30 (medium), K_2O = 88 (low)

Harvested: October 29

Previous crop: Alfalfa

Population: 16,100

Farm Cooperator: Herb and Carl Wagner, Grawn

County Extension Director: A. W. Glidden, Traverse City

Table 15 Zone 4

Northern Michigan

IOSCO COUNTY TRIAL

One and Two Years—1961 and 1963

Hybrid	Moisture % 1963	Moisture % 2 years	Bushels per acre 1963	Bushels per acre 2 years	Stalk Lodging % 1963	Stalk Lodging % 2 years
MICHIGAN 160	31	35	61	64	5	4
A.E.S. 202	32	36	72	75	10	5
DeKALB 29	33	38	73	69	5	4
FUNK BROS. G188	33	—	75	—	10	—
MICHIGAN 270	34	40	87	83	6	4
DeKALB 45	35	—	77	—	5	—
MICHIGAN 250	35	38	77	78	6	4
FUNK BROS. G6	36	—	85	—	3	—
MICHIGAN 300	37	39	84	91	2	1
FUNK BROS. G2	37	—	49	—	13	—
DeKALB 36	37	—	75	—	1	—
KINGSCROST KE 435	37	—	79	—	9	—
FUNK BROS. G10A	40	—	77	—	2	—
DeKALB XL-15 (2X)	42	—	86	—	7	—
WOLVERINE 25	42	—	58	—	4	—
FUNK BROS. G44	50	—	73	—	1	—
AVERAGE	36	38	76	77	5	4
RANGE	50 to 31	40 to 35	91 to 49	91 to 64	13 to 1	4 to 1
L.S.D.*	2	1	8	4		

*Least significant differences.

	1962	1963
Planted	May 20	May 31
Harvested	October 8	September 27
Soil type	Kawkawlin-Nester clay loam	Nester-Selkirk loam
Previous crop	Alfalfa	Grass
Population	14,300	13,300
Fertilizer	24-43-28	118-72-36
Soil test: pH	7.5	—
P_2O_5	240 (high)	—
K_2O	220 (high)	—

Farm Cooperator: Brian Bellville, Whittemore

Chamabi Ranch, Whittemore

County Extension Director: Marvin Davenport, East Tawas

Table 16 Zone 4

Northern Michigan

IOSCO COUNTY TRIAL

Silage—One Year—1963

Hybrid	Moisture %		Tons per Acre			% ears
	Ears	Stalks	Green weight	Dry weight	Ears-dry weight	in dry weight
MICHIGAN 160	48	81	10.0	3.2	2.1	65
DeKALB 29	51	77	8.6	2.9	1.7	59
FUNK BROS. G2	52	79	9.5	3.0	1.8	59
A.E.S. 202	53	78	9.8	3.0	1.6	52
FUNK BROS. G188	54	78	10.8	3.5	2.2	62
MICHIGAN 270	54	78	12.7	3.8	2.0	53
DeKALB 45	56	79	11.6	3.5	1.9	54
WOLVERINE 25	56	80	12.4	3.6	2.0	55
MICHIGAN 250	57	78	12.3	3.3	1.7	51
DeKALB 36	57	75	10.6	3.4	1.7	50
KINGSCROST KE 435	57	80	10.5	3.1	1.8	58
MICHIGAN 300	61	76	13.5	3.7	1.7	46
FUNK BROS. G10A	62	77	14.5	4.1	1.9	45
FUNK BROS. G6	63	78	13.9	3.8	1.9	50
DeKALB XL-15 (2X)	64	78	14.4	4.0	2.1	52
FUNK BROS. G44	74	78	18.3	4.2	1.0	24
AVERAGE	58	78	12.1	3.5	1.8	51
RANGE	74 to 48	82 to 75	18.3 to 8.6	4.2 to 2.9	2.2 to 1.0	65 to 24
L.S.D.*	3	2	1.0	.3	.2	

*Least significant differences.

Planted: May 20
Soil type: Kawkawlin-Nester clay loam
Fertilizer: 24-43-28
Soil test: pH = 7.5, P_2O_5 = 240 (high), K_2O = 220 (high)
Harvested. September 11
Previous crop: Alfalfa
Population: 14,300

Farm Cooperator: Brian Bellville, Whittemore
County Extension Director: Marvin Davenport, Tawas City

Table 17 Zone 4

Upper Peninsula

MENOMINEE COUNTY TRIAL

Two and Three Years—1960, 1961, and 1962

Hybrid	Moisture %		Tons per Acre		% ears	
	2 years	3 years	2 years	3 years	2 years	3 years
MICHIGAN 160	42	46	40	35	5	3
A.E.S. 202	44	47	45	39	7	5
MICHIGAN 250	46	51	40	35	7	5
DeKALB 45	47	52	42	36	4	3
MICHIGAN 300	48	53	43	35	4	2
AVERAGES	45	50	43	36	5	4

Planting Dates: June 4, 1960; June 12, 1961; May 31, 1962.
Harvest Dates: October 5, 1960; October 6, 1961; November 1, 1962.
Plant populations: 2 years (1961-62) 10,300; 3 years (1960-62) 9,900.

Farm Cooperators: Eric Kedsch and Oren Berto, Daggett
Cooperators: Gail Bowers, Manominee County Extension Director. D. L. Thurman, Upper Peninsula Experiment Station, Chatham.

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