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The 1991 Iowa Corn Yield Test Report District 7

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The 1991 Iowa Corn Yield Test Report District 7

Abstract
Results of the Iowa Corn Yield Test are published to aid Iowa farmers in selecting corn hybrids. This is the seventy-second consecutive year for the test. Data from these tests are available in three different formats. These data are first released on Iowa State University's Cooperative Extension Services' computer communication network (EXNET) usually around Thanksgiving and are available at county extension offices. Anyone can subscribe to EXNET at a cost of $25 per year and receive the data as soon as they are released. All that is required is a computer, a modem, and the cost of a telephone call.

Disciplines
Agriculture
THE 1991 IOWA CORN YIELD TEST REPORT

District 7

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The next release of the data is on computer diskettes that include a hybrid selection computer program (described in another section of this report). These are usually available a week to 10 days after the data are released on EXNET.

The final format is this publication. This year, in an effort to make this a free and a more timely publication and get it into the hands of as many farmers as possible, Iowa State University Cooperative Extension Service and Iowa Farmer Today have agreed to try this format as a method of distribution.

The presentation of data for the hybrids tested does not imply approval or endorsement by the authors or by the agencies sponsoring or conducting the test. Entries in tables 1 and 2 are designated by brand name and variety.

1991 Procedure

Producers of corn seed and Iowa State University were eligible to enter varieties in the Iowa Corn Yield Test. Each producer was allowed a maximum of six paid entries per district. All entries had to be available in a quantity of at least 10 bushels of seed.

One hundred thirty-two entries were evaluated in this district. Fifteen of the entries were determined to be widely grown and were entered by Iowa State University. In June, of even numbered years, approximately 21,000 survey cards are mailed to landowners listed in the county plat books. Based on the survey results, the 15 hybrids grown on the most acres in the district are classified as widely grown for that district. The widely grown hybrids (*) in this report were determined by the 1990 survey. Iowa State University entered a maximum of three widely grown hybrids of any given brand. These entries were given priority over the remaining 117 entries made by seed producers.

Each entry was replicated four times in four-row plots at a planting rate of 25,500 kernels per acre at each location. All locations were machine-planted. The center two rows of each plot were harvested with a corn combine. No gleaning or dropped ears were included in yield data. A moisture determination was made from each plot, and yields were corrected to 15.5 percent moisture for shelled corn.

IOWA STATE UNIVERSITY

University Extension
Ames, Iowa

Starting with the 1988 report, data for protein, oil, and starch percentages are included in the Iowa Corn Yield Test Report. Protein, oil, and starch were measured on a near-infrared reflectance analyzer that was calibrated against accepted chemical methods. Charles R. Hurburgh, Jr. of the Department of Agricultural Engineering at Iowa State University is responsible for analyzing the samples. Samples for nutrient analysis were collected from one field in each district. Data presented are averages of the four replicated plots in that field. To be consistent with the yield data, the protein, oil, and starch data were corrected to 15.5 percent moisture.

How Information Is Presented

The agronomic data presented are averages of three locations in 1989, 1990, and 1991. Yield in bushels per acre and percentage of moisture, root lodging, stalk lodging, dropped ears, stand, protein, oil, and starch are shown for all entries tested in 1991 and for those tested in 1989 and 1990 that were in the 1991 test.

Interpretation of Results

Yield differences due to variation in soil, fertility, moisture availability, insect infestation, and diseases, plus any variation due to planting and harvesting techniques, are identified through statistical analysis. The LSD values for yield shown in tables 1 and 2 represent, in bushels per acre, the amounts of yield variation that could be due to variations in the factors just mentioned. In comparing varieties, yield differences greater than the LSD value can be attributed to genetic differences in the yield potential of these varieties; yield differences less than the LSD value are not statistically different and could have been due to other factors.

Grain moistures shown in tables 1 and 2 are indications of maturity and natural drying rate. Maturity of varieties entered generally ranged from early to full season. Yield comparisons should be made among varieties of similar maturity.

It is important to select varieties having stable performance over a range of environmental conditions. High yields for two or more consecutive years indicate stable performance. Supplemental yield and agronomic information about specific varieties may be obtained from seed corn dealers and neighbors who have grown these varieties.

The protein, oil, and starch percentage data (tables 1 and 2) are quality traits important to different end-users of corn. For feed, protein is of primary interest; for wet-mill processing (ethanol and sweeteners), oil and starch content are important. These factors are under development as additions to the U.S. standards as optional criteria. Several firms have begun testing these characteristics on an exploratory basis.
<table>
<thead>
<tr>
<th>BRAND</th>
<th>VARIETY</th>
<th>CROSS</th>
<th>MOISTURE</th>
<th>PST</th>
<th>LOG PG</th>
<th>STALK LG PG</th>
<th>DROP EAR PG</th>
<th>STAND PG</th>
<th>PROTEIN PG</th>
<th>OIL PG</th>
<th>STARCH PG</th>
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</thead>
<tbody>
<tr>
<td>PIONEER</td>
<td>CRESTLAND</td>
<td>0.5</td>
<td>15.3</td>
<td>15.3</td>
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<td>15.3</td>
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<td>15.3</td>
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<tr>
<td>PIONEER</td>
<td>GOLDEN HARVEST</td>
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<td>15.3</td>
<td>15.3</td>
<td>15.3</td>
<td>15.3</td>
<td>15.3</td>
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<tr>
<td>PIONEER</td>
<td>NORTHROP KING</td>
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<tr>
<td>PIONEER</td>
<td>LEWIS</td>
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</tbody>
</table>

**TABLE 2. AVERAGES OF VARIETIES TESTED IN DISTRICT 7. LSD FOR YIELDS ARE 8 RUSHELs**
## Table 1: Average Performance of Invented Tested in District 3

<table>
<thead>
<tr>
<th>Variety</th>
<th>F5 Yield</th>
<th>F6 Yield</th>
<th>F7 Yield</th>
<th>F8 Yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variety 1</td>
<td>120.3</td>
<td>120.6</td>
<td>121.2</td>
<td>121.5</td>
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<tr>
<td>Variety 2</td>
<td>120.8</td>
<td>120.7</td>
<td>121.0</td>
<td>121.4</td>
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<tr>
<td>Variety 3</td>
<td>120.7</td>
<td>120.9</td>
<td>121.1</td>
<td>121.3</td>
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<tr>
<td>Variety 4</td>
<td>120.4</td>
<td>120.8</td>
<td>121.0</td>
<td>121.2</td>
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<td>Variety 5</td>
<td>120.5</td>
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<td>121.3</td>
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<td>Variety 6</td>
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<td>121.0</td>
<td>121.2</td>
</tr>
</tbody>
</table>

*Note: Values are in bushels per acre.*
Since 1988, new test equipment has been developed to measure composition of unground corn kernels. These instruments take 1 to 1½ minutes per sample, and measure moisture simultaneously with composition. Using these instruments, country elevators could test and segregate grain as it is received. Obviously all compositional factors cannot be high in the same hybrid. The grain market is exploring segmentation (identity preservation)—the production and marketing of certain hybrids for specific uses. This is an important change from the generic commodity approach now used.

The economic impact of compositional factors can be significant. Corn protein trades off with other protein sources in many feed rations. At $200 per ton for 44 percent protein soybean meal, the value of a 1 percent increase (e.g. from 8 percent to 9 percent) in corn protein is about 12 cents per bushel of corn. Likewise, an additional percent of oil yields about 14 cents per bushel in increased oil output in a wet processing plant. The additional ethanol or sweetener from an extra percent of starch provides 8 to 10 cents per bushel more revenue. Producers feeding livestock are in the best position to capture immediate benefits from this composition data. Country elevators with feed mills also have the ability to capitalize on increased protein in corn. The Iowa Corn Growers Association has prepared a publication to aid growers in using the nutrient data in this Corn Yield Test Report: Nutrient Content and Feeding Value of Iowa Corn, Iowa Corn Growers Association, Des Moines, Iowa 50265.

Hybrids with similar yields and agronomic characteristics may not be identical in corn protein. Therefore, feed costs can be reduced by selecting higher protein hybrids from a group with a similar yield potential. Weather and soil conditions will affect composition, but the relative ranking of hybrids does not change greatly. A higher protein hybrid will be higher than average regardless of environmental conditions that raise or lower the averages. The protein percentages reported are measures of crude protein and may not give an accurate indication of feed value if feed rations are balanced on individual amino acids rather than crude protein content.

1991 Field Data

The District 7 test was conducted on farms operated by William Hays near Malvern in Mills County, Marvin Fuller near Corning in Adams County, and Keith Sawyers near Winterset in Madison County. The field data are presented in table A.

At planting time, subsoil moisture for the district ranged from adequate to somewhat wet. Rainfall for the district was well above normal in April but was variable for the remainder of the growing season. The Mills County location received well below normal rainfall in May and August, above normal rainfall in June, and below normal rainfall in July and September. The Adams County location received near normal rainfall in May and July, above normal rainfall in June, and well below normal rainfall in August and September. The Madison County location received near normal rainfall in May, below normal rainfall in June, July, and August, and well below normal rainfall in September. Temperatures for the district were well above normal in April and June, way above normal in May, below normal in July, and near normal in August and September. The average district yield was 3 bushels per acre above the mean of the five preceding years' averages. Average location yields are listed in table A.

ORDER FORM

Iowa Corn Yield Test Hybrid Selection Program

Please send me computer diskettes of the following districts of the Iowa Corn Yield Test Results.

Year:
District 1 □ District 2 □ District 3 □ District 4 □
District 5 □ District 6 □ District 7 □ Set of 7 districts □

Each District @ $20/copy    Complete set @ $125/set

Total amount

IBM/compatible

Disk Size: 5.25" □ 3.5" □

Make of computer:

Do you have a hard disk? (20 MB, 40 MB, etc.) yes □ no □

Name

Address

Phone

Mail and make check payable to:

Extension Software Service
Iowa State University
108 Atanasoff Hall
Ames, Iowa 50011-1040
1 515 294-8658

Use of the Data in Advertisements

Iowa State University desires to maintain the credibility of data from the Iowa State Corn Yield Test. Misuse of this data in advertisements can have a negative effect on the perception of the value of this data. For advertising purposes, brand to brand comparisons should not be made unless more than one competitor brand is used in the ad and all entries of those brands in a given table are included in the ad. Specific advertisement statements by an individual company about the performance of its entries can be made as long as they are accurate statements about the data as published. A statement similar to: "See the official Iowa State University Extension Corn Yield Test Report, Pm-660-(1-7) for details," should be included in the ad.