The 1999 Iowa Corn Yield Test Report, District 4

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The 1999 Iowa Corn Yield Test Report, District 4

Abstract
Results of the Iowa Crop Performance Test-Com are published to aid Iowa farmers in selecting com hybrids. This is the 80th consecutive year for the test. These data are first released on the Iowa Crop Improvement Association's homepage at http://www.agron.iastate.edu/icia/ usually around the end of November. For additional information about electronic distribution, contact Extension Software Service, 110 EES Bldg., Haber Rd., Iowa State University, Ames, Iowa 50011-3070, telephone number (515) 294-8658.

Disciplines
Agriculture

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1999

Iowa Crop Performance Test—Corn
District 4

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The next released format of these data is on computer diskettes, which include a hybrid selection computer program described in another section of this report. These diskettes are usually available a week to 10 days after the data are released on the World Wide Web.

The final format is the printed version, which is printed and distributed by Iowa Farmer Today in its December 1999 issue. A few days later, the printed reports also are available from county extension offices.

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

Use of These Data in Advertisements
Iowa State University and the Iowa Crop Improvement Association desire to maintain the credibility of data from the Iowa Crop Performance Test—Corn. Misuse of these data in advertisements can have a negative effect on the perception of the value of these 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 competitor brands in a reported table are included in the ad. 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 with no reference to other company’s hybrids. A statement similar to: “See the official Iowa Crop Performance Test—Corn report, PM 660 (1-7) 99, for details,” should be included in the ad.

1999 Procedure
Producers of seed corn and Iowa State University were eligible to enter hybrids in the Iowa Crop Performance Test—Corn. Each producer was allowed a maximum of nine paid entries per district. All commercial entries had to be available in a quantity of at least 10 bushels of seed.

In 1999, data are reported on 184 entries in this district. Ten of the entries determined to be check hybrids were entered by the Iowa Crop Improvement Association. In June, survey cards were mailed to a random sample of corn growers in Iowa. Based on the survey results, the 10 hybrids grown on the most acres in a district were classified as check hybrids for that district. The check hybrids ($) and !) in this report were determined by the 1998 survey. The Iowa Crop Improvement Association entered a maximum of two check hybrids of any given brand. These entries were given priority over the remaining 174 entries made by seed producers.

Each entry was replicated four times in four-row plots at a planting rate of 29,000 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 gleenings 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.

Since 1988, data for protein, oil, and starch percentages have been included in the Iowa Crop Performance Test—Corn reports. Protein, oil, and starch were measured on an Infratec 1225 near-infrared transmittance analyzer calibrated against accepted chemical methods as done by Woodson-Tenant Labs, Des Moines, Iowa. Dr. Charles R. Hurburgh, Jr. of the ISU Department of Agricultural and Biosystems Engineering was 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 1997, 1998, and 1999. Yield in bushels per acre and percentages of moisture, root lodging, stalk lodging, dropped ears, stand, protein, oil, and starch are shown for all entries in 1999 and for those tested in 1997 and 1998 that were in the 1999 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 are yield shown in Tables 1 and 2 represent, in bushels per acre, the amount 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 moisture shown in Tables 1 and 2 are indications of maturity and natural drying rate. Maturity of varieties entered generally ranged from short to full season. Yield comparisons should be made among varieties of similar maturity.
<table>
<thead>
<tr>
<th>Variety</th>
<th>Brand</th>
<th>Protein Varieties</th>
<th>Yield Bu/A</th>
<th>Moisture Pct</th>
<th>Root Ldg Pct</th>
<th>Stalk Ldg Pct</th>
<th>Drop Ear Pct</th>
<th>Stand Pct</th>
<th>Protein Pct</th>
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</table>

Table 2: Averages of 1999-99 and 1997-99 of Varieties Tested in District 4. LSD for Yields Are 9 Bushels for 97-99 and 7 Bushels for 98-99. 97-99 Protein LSD = 0.2. 98-99 Oil LSD = 0.1. 97-99 Starch LSD = 0.3. 98-99 Starch LSD = 0.4.
It is important to select varieties having stable performance over a range of environmental conditions. High yields for two or more consecutive years. Table 2, indicate stable performance. Supplemental yield and agronomic information about specific varieties may be obtained from seed corn dealers, crop consultants, and from 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. Several firms have begun testing these characteristics on a routine basis. There are now more than 50 Iowa grain elevators with this testing capability.

Whole-grain near-infrared equipment measures composition of unground corn kernels in 1 to 1.5 minutes per sample. The equipment measures moisture simultaneously with composition. Using these instruments, country elevators can test and segregate grain as it is received. Obviously, all compositional factors cannot be high in the same hybrid. The grain in 1 to 1.5 minutes per sample. The equipment measures moisture simultaneously with composition. Using these instruments, country elevators can test and segregate grain as it is received. Obviously, all compositional factors cannot be high in the same hybrid. The grain market is expanding the production and marketing of certain hybrids for specific uses. This is an important change from the generic commodity approach widely used now.

The economic impact of compositional factors can be significant. Corn protein trades off with other protein sources in many feed rations. At $2.00 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 10 to 14 cents per bushel in increased oil output in a wet processing plant or when substituted for white grease in feed rations. 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 these 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 the Iowa Crop Performance Test. Corn reports: 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 composition. Therefore, feed costs can be reduced by selecting higher protein hybrids from a group with similar yield potential. Weather and soil conditions 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 nutrient data in the District 5, District 6, District 7, and District 8 reports are available at your county extension office or from Extension Distribution Center, 119 Printing and Publications Building, Iowa State University, Ames, Iowa 50011. Also, an IBM compatible diskette containing these data along with a hybrid selection program is available from Extension Service, 110 EES Bldg., Haber Road, Iowa State University, Ames, Iowa 50011-3070. Along with all of the information as it appears in the written reports, the computer diskette include computer programs that allow farmers to insert their own drying and shrink costs, expected price of corn, and final protein percentage after drying. Using these specific criteria, the program calculates an adjusted economic value for each hybrid in the test. Farmers can then determine which hybrids might best fit their own production practices and provide the most profit. The computer program also can sort the hybrids by yield, moisture, adjusted value, root lodging, stalk lodging, dropped ears, protein, oil, starch, or brand and then print the data as sorted. An IBM personal or compatible computer supporting MS-DOS 2.0 or higher, with at least 512K memory, is required. The cost of this diskette is $25. All seven districts can be purchased for $150. Order forms, PM 660 OF 99, are available from your county extension offices and included in the printed reports.

1999 Field Data

The District 4 test was planted on farms operated by Maurice Wilt near Salix in Woodbury County. Rod Backhaus near Westside in Crawford County, and the McNichols brothers near Missouri Valley in Harrison County. Field data are presented in Table A. At planting time, subsoil moisture for the district was adequate to excessive. Rainfall for the district was way above normal in April, below normal in May, near normal in June, and well below normal in September. In July, the Crawford County location received well above normal rainfall while the other two locations received above normal rainfall. Temperatures for the district were near normal in April and May, below normal in June, August, and September, and well above normal in July. The average district yield was 12 bushels per acre above the mean of the five preceding years' averages. Average location yields are listed in Table A.

Table A. Field Data

<table>
<thead>
<tr>
<th>Location</th>
<th>Crop Yield 60</th>
<th>Protein 60</th>
<th>Oil 60</th>
<th>Starch 60</th>
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*Field sampled for protein, oil, and starch percentage data.

Other Reports

Separate reports are available for each district shown in Figure 1. A limited supply of these publications is available at your county extension office or from Extension Distribution Center, 119 printing and Publications Building, Iowa State University, Ames, Iowa 50011. Also, an IBM compatible diskette containing these data along with a hybrid selection program is available from Extension Service, 110 EES Bldg., Haber Road, Iowa State University, Ames, Iowa 50011-3070. Along with all of the information as it appears in the written reports, the computer diskette include computer programs that allow farmers to insert their own drying and shrink costs, expected price of corn, and final protein percentage after drying. Using these specific criteria, the program calculates an adjusted economic value for each hybrid in the test. Farmers can then determine which hybrids might best fit their own production practices and provide the most profit. The computer program also can sort the hybrids by yield, moisture, adjusted value, root lodging, stalk lodging, dropped ears, protein, oil, starch, or brand and then print the data as sorted. An IBM personal or compatible computer supporting MS-DOS 2.0 or higher, with at least 512K memory, is required. The cost of this diskette is $25. All seven districts can be purchased for $150.

Order Form: Iowa Crop Performance Test—Corn Hybrid Selection Program

Please send me computer diskettes of the following districts of the Iowa Crop Performance Test. Corn reports.

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

Each diskette at $25/copy

Complete set at $150/set

Total amount

IBI-compatible; disk size 3.5" only

Make of computer:

Do you have access to EXNET and/or the Internet? yes no

Name:

Address:

Phone:

Mail and make check payable to:
- Extension Software Service
- Iowa State University
- 110 EES Building
- Haber Road
- Ames, Iowa 50011-3070
- 515-294-8658


Cooperating Organizations

Iowa Crop Improvement Association
Agriculture & Home Economics Experiment Station
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U.S. Department of Agriculture

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