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Crude Protein of Hybrid Corn Varieties Evaluated in the Kentucky Hybrid Corn Performance Tests from 1990 to 1993

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Crude Protein of Hybrid Corn Varieties Evaluated in the Kentucky Hybrid Corn Performance Tests from 1990 to 1993[1].

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Grain samples have been collected each year since 1990 from three locations of the Kentucky Hybrid Corn Performance Test and analyzed for crude protein. The objective was to provide an unbiased comparative evaluation of the crude protein content of corn hybrids sold in Kentucky. The results indicate that while management and environment at each test location may have significant influences, crude protein does differ among hybrid genotypes. The feeding value of specific hybrid genotypes based on their protein content may have significant influence in diet formulation for non-ruminant animals owing to the amount of supplement needed to properly balance the diet, and may be an important economic factor in animal production. Previous summaries of annual results have been published (1,2). Only crude protein data are included in this report and are summarized over locations in a year and as multiple year summaries.

MATERIALS AND METHODS:

Three replicates of each hybrid were sampled at each of the three test locations. The locations in each year are shown in Table 1. The agronomic practices at each location followed Extension Service recommendations for fertilizers, herbicides, and insecticides. Details of site weather conditions and specific agronomic practices at each site can be found in the annual Hybrid Corn Performance Test Progress Reports (3,4,5,6). One hundred and thirty-two hybrids were grown in each year. About 40% of the hybrids were new each year so that the number of hybrids included in the averages over years will vary. The annual crude protein analyses were statistically analyzed as randomized complete blocks.

A 250 g grain sample was taken from each harvested plot after weight and moisture determination. The samples were dried to a uniform moisture content in a forced air dryer and then ground with Glen Mills Disc Mill, Model S.500. Ground samples were stored in plastic specimen cups until analysis by Near Infrared Spectroscopy (NIRS)(7). Each year a subset of all samples was chosen to adjust the NIRS calibration curve. The calibration samples were analyzed by micro-kjeldahl for total nitrogen content and then

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multiplied by 6.25 to estimate crude protein content as percent of dry weight (8). Crude protein values in Table 2 are from NIRS evaluations using an NIRS equation adjusted using samples from the 1993 trials. All values are reported at 0 percent moisture. Grain yield per acre, 16% base diet per acre, and cost per ton of base diet, reported in the previous publications (1,2), are not included in this report. Yield data are available in the appropriate progress reports and base diet quantity and cost summaries are available upon request from the authors.

Lysine analyses were obtained for the 1991 and 1992 samples. The 1991 lysine analyses were reported (2) but 1992 analyses could not be reconciled with 1991 analyses and further studies were conducted in 1993 to resolve the lysine analyses problems. These results will be reported later.

RESULTS AND DISCUSSION:

The mean crude protein content at each test site in any year varied significantly (Table 1). High grain yield locations tended to have lower protein contents while lower grain yield locations had higher crude protein contents. A combined NIRS analysis of oil, starch and protein (data not reported) supports our contention that high grain yield tends to occur from increased accumulation of starch rather than protein although the data need further analysis to determine specific effects of locations and/or special management conditions.

The three location annual average crude protein content of hybrids varied considerably in each year. The lowest to highest range was 8.4 to 10.1% in 1990, 8.9 to 11.0% in 1991, 7.7 to 9.1% in 1992, and 7.6 to 9.4% in 1993. Hybrids with high average crude protein tended to be high in each year, and hybrids with low average crude protein tended to be low each year. However, the range between hybrids with the lowest and highest crude protein was smaller for the multiple year averages than for annual averages. This smaller range may have been due, in part, to fewer hybrids in multiple year averages but was also due partially to year variations that minimized differences when averaged.

In each year of testing, there was a significant hybrid by location interaction for crude protein content. The presence of this interaction serves as a caution that one should not use data from one location to predict performance at another location. The differences in crude protein content from one location to another, even in the same year, were often as great as 2 percentage points; i.e., the 1991 average of 132 hybrids varied by 2.1 percentage points between the Shelbyville and Lexington locations. Individual hybrid variations were much greater. For a farmer attempting to balance diets containing corn with protein supplement, a 2 point variation in crude protein could cause serious error in the protein content of the resulting animal diets. As a practical interpretation, the authors suggest that the hybrid average containing the most replications, locations, and years would be the most reliable predictor of a hybrid's relative crude protein level. Furthermore, the level of crude protein for a specific corn grain lot should be obtained by testing that lot for protein content rather than relying on long term averages, as might be obtained from this publication or from other published summaries of corn protein content. For example, the hybrid with the highest crude protein level, 9.7 % for the four year average, varied from 8.7 to 10.7 % among the four years (Table 2), and a much greater range was observed among individual location data.

CONCLUSIONS:

The data contained in this publication can be used by corn growers to identify hybrids that are likely to produce the highest crude protein content. Conversely, a farmer can choose not to plant a hybrid likely to produce a grain crop with low crude

protein content. Such a low protein hybrid would require more protein supplement and thus would cause an increased unit feed cost. Lysine evaluations of these same hybrids will be published later to address this question. Further economic analysis for feed value of the grain produced by each hybrid can be calculated by use of grain yield and production costs plus feed formulation costs using one or more protein supplements. Formulae for calculation of amount and cost of a 16% protein base diet are given in previous Agronomy Notes publication (1,2). Because corn grain is low in the amino acid lysine which is the most limiting amino acid in swine diets, the lysine concentration may also effect the feed value.

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Table 1. Kentucky Hybrid Corn Performance Test sites with average grain yield and crude protein content means for 1990 to 1993.

Year	Location	% Crude Protein	Yield bu/ac	Year	Location	% Crude Protein	Yield bu/ac
1990	Benton	10.1	80.3	1992	Hickman	8.7	163.0
	Shelbyville	8.9	108.6		Shelbyville	8.4	204.3
	Lexington	9.4	156.3		Lexington	8.4	177.9
1991	Benton	9.6	153.9	1993	Hopkinsville	9.2	102.7
	Shelbyville	9.3	122.8		Hodgenville	8.6	159.8
	Lexington	11.4	84.0		Lexington	7.9	143.4

Table 2. Crude protein content of commercial corn hybrids grown in the 1990 to 1993 Kentucky Hybrid Corn Performance Tests. All values are for grain at 0 % moisture.

NAME	ANNUAL 3 LOCATION AVERAGES				MULTIPLE YEAR AVERAGES					
	1990	1991	1992	1993	4 YEAR 90-93	3-YEAR 91-93	2-YEAR 92-93	3-YEAR 90-92	2-YEAR 91-92	2-YEAR 90-91
SO. STATES SS917W	9.9	10.7	8.7	9.3	9.7	9.6	9.0	9.8	9.7	10.3
CROW'S 669	9.8	10.4	8.7	8.9	9.5	9.3	8.8	9.6	9.5	10.1
CALLAHAN C776	9.9	10.3	8.8	9.1	9.5	9.4	9.0	9.7	9.6	10.1
CAVERNDALE FM. CF 950	9.8	10.5	8.5	8.7	9.4	9.2	8.6	9.6	9.5	10.1
CROW'S 670	9.7	10.7	8.4	9.0	9.4	9.4	8.7	9.6	9.6	10.2
NORTHRUP KING N8727	9.7	10.4	8.8	8.9	9.4	9.4	8.8	9.6	9.6	10.1
DEKALB NB742W	9.6	10.3	8.9	8.7	9.4	9.3	8.8	9.6	9.6	9.9
TERRA SEED TR1180	9.6	10.2	8.6	8.9	9.3	9.3	8.8	9.5	9.4	9.9
ZIMMERMAN Z61W	9.7	10.4	8.5	8.6	9.3	9.2	8.6	9.5	9.4	10.0
JACQUES 8210	9.6	10.0	8.5	8.7	9.2	9.1	8.6	9.4	9.2	9.8
ADLERS 6130	9.4	10.1	8.8	8.6	9.2	9.2	8.7	9.4	9.5	9.7
BO-JAC 925	9.1	10.1	8.5	8.9	9.2	9.2	8.7	9.2	9.3	9.6
FR27 X PA91	9.5	9.9	8.5	8.5	9.1	9.0	8.5	9.3	9.2	9.7
PRAIRIE STREAM SX702	9.5	9.8	8.3	8.2	9.0	8.8	8.3	9.2	9.1	9.7
ICI SEEDS 8315	9.1	9.9	8.4	8.5	9.0	8.9	8.4	9.1	9.1	9.5
SO. CROSS SC-411	9.5	9.8	8.4	8.5	9.0	8.9	8.4	9.2	9.1	9.7
AGRIGOLD A-6715	9.2	9.9	8.3	8.6	9.0	8.9	8.5	9.1	9.1	9.5
COLBERT 324	9.2	9.9	8.5	8.6	9.0	9.0	8.5	9.2	9.2	9.6
DEKALB DK715	9.5	10.0	8.1	8.4	9.0	8.8	8.2	9.2	9.0	9.8
SCOTT SEED S3350	9.0	9.8	8.4	8.8	9.0	9.0	8.6	9.1	9.1	9.4
COLBERT 326	9.1	10.0	8.3	8.2	8.9	8.8	8.3	9.1	9.1	9.5
ZIMMERMAN Z27	9.2	10.0	8.4	8.1	8.9	8.8	8.2	9.2	9.2	9.6
FR27 X M017	9.2	9.6	8.3	8.4	8.9	8.8	8.4	9.0	9.0	9.4
BECK'S 72X	9.2	9.8	8.3	8.5	8.9	8.9	8.4	9.1	9.1	9.5
AGRIGENE AG 7935	8.9	9.6	8.4	7.8	8.7	8.6	8.1	9.0	9.0	9.3
PIONEER BRAND 3154	8.9	9.7	8.1	8.1	8.7	8.7	8.1	8.9	8.9	9.3
CARGILL 9027	8.5	9.6	7.9	7.8	8.4	8.4	7.8	8.7	8.7	9.0
PIONEER BRAND 3140	8.7	9.1	7.7	7.7	8.3	8.2	7.7	8.5	8.4	8.9
PIONEER BRAND 3165	8.4	8.9	7.8	7.6	8.2	8.1	7.7	8.4	8.4	8.6
PIONEER BRAND 3281W	.	10.3	9.0	9.2	.	9.5	9.1	.	9.7	.
BECK'S 68	.	10.6	8.8	8.9	.	9.4	8.9	.	9.7	.
CIBA SEEDS 4631	.	10.3	8.5	9.3	.	9.4	8.9	.	9.4	.
CIBA SEEDS 4671	.	10.3	8.8	9.0	.	9.4	8.9	.	9.5	.
VINEYARD SEED V-58W	.	10.2	8.4	8.8	.	9.2	8.6	.	9.3	.
PIONEER BRAND 3245	.	10.0	8.8	8.8	.	9.2	8.8	.	9.4	.
AGRATECH 787	.	10.4	8.6	8.7	.	9.2	8.6	.	9.5	.
DEKALB DK743	.	10.3	8.5	8.6	.	9.2	8.6	.	9.4	.
JACQUES 7970	.	10.4	8.2	8.9	.	9.2	8.6	.	9.3	.
NORTHRUP KING PX9540	.	9.9	8.5	8.7	.	9.0	8.6	.	9.2	.
GLICK SEED GH801	.	10.0	8.4	8.6	.	9.0	8.5	.	9.2	.
DEKALB NB739W	.	9.9	8.5	8.7	.	9.0	8.6	.	9.2	.
STEWART HYBRIDS S-9213	.	10.0	8.3	8.7	.	9.0	8.5	.	9.2	.
ZIMMERMAN Z63W	.	10.1	8.4	8.6	.	9.0	8.5	.	9.3	.
AGRATECH 757	.	10.1	8.2	8.5	.	8.9	8.4	.	9.2	.
BO-JAC 629	.	9.8	8.6	8.1	.	8.9	8.4	.	9.2	.

Table 2. Continued.

NAME	ANNUAL 3 LOCATION AVERAGES				MULTIPLE YEAR AVERAGES					
	1990	1991	1992	1993	4 YEAR 90-93	3-YEAR 91-93	2-YEAR 92-93	3-YEAR 90-92	2-YEAR 91-92	2-YEAR 90-91
SO. STATES SS812	.	9.9	8.7	8.2	.	8.9	8.5	.	9.3	.
AGRIGOLD A-6690	.	9.9	8.4	8.3	.	8.8	8.3	.	9.1	.
CARGILL 7997	.	9.6	8.6	8.4	.	8.8	8.5	.	9.1	.
COLBERT 230	.	9.8	8.3	8.4	.	8.8	8.3	.	9.0	.
ASGROW RX919	.	9.7	8.2	8.0	.	8.6	8.1	.	8.9	.
PIONEER BRAND 3394	.	9.5	8.1	8.3	.	8.6	8.2	.	8.8	.
CARGILL 9402W	.	.	9.0	9.3	.	.	9.2	.	.	.
PRAIRIE STREAM SX556	.	.	9.1	9.1	.	.	9.1	.	.	.
VINEYARD SEED V-449W	.	.	8.7	9.2	.	.	8.9	.	.	.
ASGROW RX795	.	.	8.8	9.0	.	.	8.9	.	.	.
NORTHRUP KING N7707	.	.	9.0	8.9	.	.	8.9	.	.	.
SO. STATES SS922W	.	.	8.8	8.7	.	.	8.8	.	.	.
CAVERNDALE FM. CF 953	.	.	8.9	8.8	.	.	8.8	.	.	.
CAVERNDALE FM. CF 800A	.	.	8.7	8.7	.	.	8.7	.	.	.
CROW'S 667	.	.	8.6	8.7	.	.	8.7	.	.	.
PRAIRIE STREAM SX704	.	.	8.6	8.7	.	.	8.7	.	.	.
AGRIGENE AG 7900	.	.	8.4	8.8	.	.	8.6	.	.	.
GUTWEIN 2680	.	.	8.5	8.7	.	.	8.6	.	.	.
GUTWEIN 2751	.	.	8.5	8.7	.	.	8.6	.	.	.
ICI SEEDS 8122W	.	.	8.8	8.5	.	.	8.6	.	.	.
PIONEER BRAND 3279	.	.	8.4	8.7	.	.	8.6	.	.	.
SO. CROSS SC-612	.	.	8.5	8.7	.	.	8.6	.	.	.
CIBA SEEDS 4652W	.	.	8.3	8.7	.	.	8.5	.	.	.
GUTWEIN 2810	.	.	8.4	8.6	.	.	8.5	.	.	.
NORTHRUP KING N7989	.	.	8.4	8.6	.	.	8.5	.	.	.
NORTHRUP KING N7580W	.	.	8.3	8.7	.	.	8.5	.	.	.
SO. STATES SS943	.	.	8.3	8.7	.	.	8.5	.	.	.
ADLERS 7850	.	.	8.4	8.5	.	.	8.4	.	.	.
CALLAHAN C7269	.	.	8.6	8.1	.	.	8.4	.	.	.
ICI SEEDS 8513	.	.	8.4	8.5	.	.	8.4	.	.	.
SO. CROSS SC-412	.	.	8.3	8.6	.	.	8.4	.	.	.
NORTHRUP KING N6330	9.5	.	8.1	8.4	.	.	8.3	.	.	.
TERRA SEED TR1167	.	.	8.5	8.2	.	.	8.3	.	.	.
JACQUES 9220	.	.	8.2	8.3	.	.	8.2	.	.	.
FR618 X FR600	.	.	8.4	8.1	.	.	8.2	.	.	.
DEKALB DK646	.	.	8.1	8.2	.	.	8.1	.	.	.
CARGILL 9400W	10.1	11.0	9.0	.	.	.	.	10.0	10.0	10.5
AGRATECH 825	9.9	10.5	8.7	.	.	.	.	9.7	9.6	10.2
AGRIGOLD A-6796W	9.7	10.7	8.6	.	.	.	.	9.7	9.7	10.2
GARST SEED 8250	9.9	10.4	8.8	.	.	.	.	9.7	9.6	10.2
NORTHRUP KING N8565W	9.7	10.6	8.8	.	.	.	.	9.7	9.7	10.2
CARGILL 8427	9.9	10.3	8.9	.	.	.	.	9.7	9.6	10.1
STEWART HYBRIDS S-8815	9.4	10.2	8.8	.	.	.	.	9.5	9.5	9.8
ASGROW RX947	9.6	10.0	8.8	.	.	.	.	9.5	9.4	9.8
ICI/SC W707	9.5	10.3	8.6	.	.	.	.	9.5	9.4	9.9
MCCURDY 7477	9.5	10.1	8.5	.	.	.	.	9.4	9.3	9.8

Table 2. Continued.

NAME	ANNUAL 3 LOCATION AVERAGES				MULTIPLE YEAR AVERAGES					
	1990	1991	1992	1993	4 YEAR 90-93	3-YEAR 91-93	2-YEAR 92-93	3-YEAR 90-92	2-YEAR 91-92	2-YEAR 90-91
SO. STATES SS790	9.6	10.2	8.6	.	.	.	.	9.4	9.4	9.9
SO. STATES SS793	9.4	10.2	8.6	.	.	.	.	9.4	9.4	9.8
SCOTT SEED LR 5241	9.4	10.0	8.5	.	.	.	.	9.3	9.3	9.7
CROW'S 688	9.1	10.2	8.3	.	.	.	.	9.2	9.3	9.7
BO-JAC 905	9.3	9.9	8.4	.	.	.	.	9.2	9.2	9.6
GLICK SEED GH780	9.0	10.1	8.6	.	.	.	.	9.2	9.3	9.5
DEKALB DK689	9.0	10.0	8.2	.	.	.	.	9.1	9.1	9.5
PIONEER BRAND 3295	9.3	9.7	8.0	.	.	.	.	9.0	8.8	9.5
PIONEER BRAND 3142	8.8	9.7	8.2	.	.	.	.	8.9	8.9	9.2
MCCURDY 7400	.	10.6	8.8	.	.	.	.	.	9.7	.
NOBLE BEAR NB 747W	.	10.6	8.9	.	.	.	.	.	9.7	.
VINEYARD SEED MV-68W	.	10.6	8.7	.	.	.	.	.	9.6	.
BALDRIDGE BH 575	.	10.5	8.7	.	.	.	.	.	9.6	.
CIBA-GEIGY 4651	.	10.2	8.6	.	.	.	.	.	9.4	.
SCOTT SEED LR 3359	.	10.1	8.6	.	.	.	.	.	9.4	.
STINE SEEDS 1181	.	10.0	8.8	.	.	.	.	.	9.4	.
ZIMMERMAN Z16W	.	10.1	8.3	.	.	.	.	.	9.2	.
ASGROW RX899	.	10.0	8.3	.	.	.	.	.	9.2	.
STINE SEEDS 1118	.	9.9	8.2	.	.	.	.	.	9.1	.
ASGROW RX956W	9.9	10.9	.	.	.	.	.	.	.	10.4
SO. CROSS 711	10.0	10.6	.	.	.	.	.	.	.	10.3
CAVERNDALE FM. CF925	9.9	10.3	.	.	.	.	.	.	.	10.1
FR27 X LH38	9.6	10.4	.	.	.	.	.	.	.	10.0
AGRIGOLD A-6720	9.8	10.2	.	.	.	.	.	.	.	10.0
CAVERNDALE FM. CF975	9.6	10.3	.	.	.	.	.	.	.	10.0
HYPERFORMER HS97	9.7	10.2	.	.	.	.	.	.	.	9.9
ASGROW RX908	9.8	10.0	.	.	.	.	.	.	.	9.9
HUBNER SEED H3717	9.5	10.2	.	.	.	.	.	.	.	9.9
GARST SEED SC-W700	9.5	10.3	.	.	.	.	.	.	.	9.9
TERRA SEEDS TR1170	9.8	10.1	.	.	.	.	.	.	.	9.9
DEKALB DK677	9.8	10.1	.	.	.	.	.	.	.	9.9
DEKALB DK643	9.6	10.1	.	.	.	.	.	.	.	9.9
SO. CROSS 511	9.0	10.5	.	.	.	.	.	.	.	9.8
PIONEER BRAND 3144W	9.5	9.9	.	.	.	.	.	.	.	9.7
FUNK'S G-4666	9.4	10.0	.	.	.	.	.	.	.	9.7
SO. CROSS 611	9.4	10.0	.	.	.	.	.	.	.	9.7
TERRA SEEDS TR1190	9.3	10.0	.	.	.	.	.	.	.	9.7
BECK'S 81X	9.4	10.1	.	.	.	.	.	.	.	9.7
HYPERFORMER HS9773	9.3	10.0	.	.	.	.	.	.	.	9.6
CROW'S 682	9.3	9.5	.	.	.	.	.	.	.	9.4
PIONEER BRAND 3180	9.0	9.7	.	.	.	.	.	.	.	9.4
LYNK'S SEED 2831W	.	.	.	9.4	.	.	.	.	.	.
AGRIGOLD A-6565W	.	.	.	9.2	.	.	.	.	.	.
DEKALB DK703W	.	10.3	.	9.1	.	.	.	.	.	.
CARGILL 8097W	.	.	.	9.1	.	.	.	.	.	.
VINEYARD SEED VX4532W	.	.	.	9.1	.	.	.	.	.	.

Table 2. Continued.

NAME	ANNUAL 3 LOCATION AVERAGES				MULTIPLE YEAR AVERAGES					
	1990	1991	1992	1993	4 YEAR 90-93	3-YEAR 91-93	2-YEAR 92-93	3-YEAR 90-92	2-YEAR 91-92	2-YEAR 90-91
VORIS 8020	.	.	.	9.0	.	.	.	.	.	.
CALLAHAN C7265	.	.	.	8.9	.	.	.	.	.	.
CIBA SEEDS 4592W	.	.	.	8.9	.	.	.	.	.	.
DEKALB DK714	.	.	.	8.9	.	.	.	.	.	.
STEWART HYBRIDS S-9315	.	.	.	8.9	.	.	.	.	.	.
AGRATECH 810	.	.	.	8.8	.	.	.	.	.	.
AGRIGENE AG 7885	.	.	.	8.8	.	.	.	.	.	.
SO. STATES XP 53562W	.	.	.	8.8	.	.	.	.	.	.
CIBA SEEDS 4494	.	.	.	8.7	.	.	.	.	.	.
PIONEER BRAND 3156	.	.	.	8.7	.	.	.	.	.	.
AGRIGOLD A-6605	.	.	.	8.6	.	.	.	.	.	.
GLICK SEED GH752	.	.	.	8.6	.	.	.	.	.	.
ICI SEEDS 8285	.	.	.	8.6	.	.	.	.	.	.
ICI SEEDS N8255	.	.	.	8.6	.	.	.	.	.	.
VORIS 7530	.	.	.	8.6	.	.	.	.	.	.
TERRA SEED TR641E	.	.	.	8.6	.	.	.	.	.	.
ASGROW RX896	.	.	.	8.5	.	.	.	.	.	.
ASGROW RX897	.	.	.	8.5	.	.	.	.	.	.
ASGROW RX775	.	.	.	8.5	.	.	.	.	.	.
BECK'S 81MVP	.	.	.	8.5	.	.	.	.	.	.
TERRA SEED E 1168	.	.	.	8.5	.	.	.	.	.	.
BO-JAC 7195	.	.	.	8.4	.	.	.	.	.	.
CARGILL 8327	.	.	.	8.4	.	.	.	.	.	.
CIBA SEEDS 4742	.	.	.	8.4	.	.	.	.	.	.
GUTWEIN 2656	.	.	.	8.4	.	.	.	.	.	.
JACQUES 8240	.	.	.	8.4	.	.	.	.	.	.
SO. CROSS SC-902	.	.	.	8.4	.	.	.	.	.	.
SO. STATES SS742A	.	.	.	8.4	.	.	.	.	.	.
LYNKS SEEDS 2868	.	.	.	8.4	.	.	.	.	.	.
LYNK'S SEED 2829	.	.	.	8.4	.	.	.	.	.	.
SO. STATES SS682	.	.	.	8.4	.	.	.	.	.	.
AGRIGENE AG 7890	.	.	.	8.3	.	.	.	.	.	.
CAVERNDALE FM. CF 790	.	.	.	8.3	.	.	.	.	.	.
COLBERT 279	.	.	.	8.3	.	.	.	.	.	.
CROW'S 510	.	.	.	8.3	.	.	.	.	.	.
DEKALB DK683	.	.	.	8.3	.	.	.	.	.	.
SCOTT SEED S5263	.	.	.	8.3	.	.	.	.	.	.
STEWART HYBRIDS S-9312	.	.	.	8.3	.	.	.	.	.	.
ZIMMERMAN Z64W	.	.	.	8.3	.	.	.	.	.	.
CALLAHAN C783	.	9.9	.	8.2	.	.	.	.	.	.
AGRIGOLD A-6470	.	.	.	8.2	.	.	.	.	.	.
CROW'S 668	.	.	.	8.2	.	.	.	.	.	.
DEKALB DK668	.	.	.	8.2	.	.	.	.	.	.
ZIMMERMAN Z29	.	.	.	8.2	.	.	.	.	.	.
PIONEER BRAND 3163	.	.	.	8.1	.	.	.	.	.	.
PIONEER BRAND 3167	.	.	.	7.7	.	.	.	.	.	.

Table 2. Continued.

NAME	ANNUAL 3 LOCATION AVERAGES				MULTIPLE YEAR AVERAGES					
	1990	1991	1992	1993	4 YEAR 90-93	3-YEAR 91-93	2-YEAR 92-93	3-YEAR 90-92	2-YEAR 91-92	2-YEAR 90-91
ICI/GARST 8260	.	.	9.0	.	.	.	.	.	.	.
NC+ HYBRIDS NC+ 5860	.	.	8.9	.	.	.	.	.	.	.
TERRA SEED TR621E	.	.	8.9	.	.	.	.	.	.	.
BALDRIDGE BH 605	.	.	8.9	.	.	.	.	.	.	.
STEWART HYBRIDS HYL 1	.	.	8.8	.	.	.	.	.	.	.
STINE SEEDS 1171	.	.	8.8	.	.	.	.	.	.	.
ASGROW RX809	.	.	8.7	.	.	.	.	.	.	.
NC+ HYBRIDS NC+ 6485	.	.	8.7	.	.	.	.	.	.	.
AGRIGOLD XA2002	.	.	8.6	.	.	.	.	.	.	.
BECK'S 82MVP	.	.	8.6	.	.	.	.	.	.	.
CIBA-GEIGY 4583	.	.	8.5	.	.	.	.	.	.	.
NC+ HYBRIDS NC+ 6555W	.	.	8.5	.	.	.	.	.	.	.
TERRA SEED TR1160	.	.	8.5	.	.	.	.	.	.	.
COLBERT 250	.	.	8.4	.	.	.	.	.	.	.
NC+ HYBRIDS NC+ 7304	.	.	8.4	.	.	.	.	.	.	.
STINE SEEDS 1250	.	.	8.4	.	.	.	.	.	.	.
PIONEER BRAND 3527	.	.	8.3	.	.	.	.	.	.	.
JACQUES 8510	9.4	.	8.2	.	.	.	.	.	.	.
NC+ HYBRIDS NC+ 6959	.	.	8.2	.	.	.	.	.	.	.
DEKALB DK633	.	.	8.1	.	.	.	.	.	.	.
STEWART HYBRIDS S-8432	.	.	8.0	.	.	.	.	.	.	.
AGRIGENE GA-9586	8.9	.	7.9	.	.	.	.	.	.	.
GARST SEED 8316	.	10.9	.	.	.	.	.	.	.	.
JACQUES 8410	.	10.8	.	.	.	.	.	.	.	.
NORTHRUP-KING S8505	.	10.5	.	.	.	.	.	.	.	.
HUBNER SEED H8819W	.	10.5	.	.	.	.	.	.	.	.
HUBNER SEED H3715	.	10.4	.	.	.	.	.	.	.	.
UAP DYNA-GRO 5655	.	10.4	.	.	.	.	.	.	.	.
ASGROW RX811	.	10.3	.	.	.	.	.	.	.	.
CALLAHAN C775	.	10.3	.	.	.	.	.	.	.	.
GLICK SEED GH760	.	10.3	.	.	.	.	.	.	.	.
GLICK SEED GH796	.	10.2	.	.	.	.	.	.	.	.
HYPERFORMER HS 9704	.	10.2	.	.	.	.	.	.	.	.
HUBNER SEED H3318	.	10.1	.	.	.	.	.	.	.	.
AGRATECH 6902	.	10.1	.	.	.	.	.	.	.	.
UAP DYNA-GRO 5561	.	10.1	.	.	.	.	.	.	.	.
GARST SEED 8105	.	10.0	.	.	.	.	.	.	.	.
PRAIRIE STREAM SX565	.	10.0	.	.	.	.	.	.	.	.
STINE 1161	.	10.0	.	.	.	.	.	.	.	.
UAP DYNA-GRO 5671	.	10.0	.	.	.	.	.	.	.	.
ADLERS 7905	.	9.9	.	.	.	.	.	.	.	.
AGRATECH 6610	.	9.9	.	.	.	.	.	.	.	.
STINE 1225	.	9.9	.	.	.	.	.	.	.	.
TERRA SEEDS TR3400	.	9.9	.	.	.	.	.	.	.	.
COLBERT 318	.	9.8	.	.	.	.	.	.	.	.
AGRATECH 6640	.	9.8	.	.	.	.	.	.	.	.

Table 2. Continued.

NAME	ANNUAL 3 LOCATION AVERAGES				MULTIPLE YEAR AVERAGES					
	1990	1991	1992	1993	4 YEAR 90-93	3-YEAR 91-93	2-YEAR 92-93	3-YEAR 90-92	2-YEAR 91-92	2-YEAR 90-91
SCOTT SEED LR 3347	.	9.8	.	.	.	.	.	.	.	.
NORTHRUP-KING N7816	.	9.8	.	.	.	.	.	.	.	.
STEWART HYBRIDS S-9212	.	9.6	.	.	.	.	.	.	.	.
NORTHRUP-KING N8318	.	9.4	.	.	.	.	.	.	.	.
JACOBI 8901	10.0	.	.	.	.	.	.	.	.	.
HUBNER SEED H8819W	10.0	.	.	.	.	.	.	.	.	.
TERRA SEEDS TR367E	10.0	.	.	.	.	.	.	.	.	.
JACQUES 8400	9.9	.	.	.	.	.	.	.	.	.
PRAIRIE STREAM SX726	9.9	.	.	.	.	.	.	.	.	.
PRAIRIE STREAM M7000	9.9	.	.	.	.	.	.	.	.	.
SCOTT SEED LR3345	9.9	.	.	.	.	.	.	.	.	.
SEEDEX 1175	9.9	.	.	.	.	.	.	.	.	.
SUPER CROST 7810	9.9	.	.	.	.	.	.	.	.	.
GOLDEN AC. T-E 6996	9.8	.	.	.	.	.	.	.	.	.
BECK'S 83X	9.8	.	.	.	.	.	.	.	.	.
NOBLEBEAR NB855	9.8	.	.	.	.	.	.	.	.	.
SEEDEX 1135	9.8	.	.	.	.	.	.	.	.	.
UNITED AGRI PROD. UAPX5001	9.8	.	.	.	.	.	.	.	.	.
AGRATECH GK900	9.7	.	.	.	.	.	.	.	.	.
FUNK'S G-4660W	9.7	.	.	.	.	.	.	.	.	.
AGRIGOLD A-6655	9.7	.	.	.	.	.	.	.	.	.
ASGROW/O'S GOLD RX911	9.7	.	.	.	.	.	.	.	.	.
SO. STATES SS847	9.7	.	.	.	.	.	.	.	.	.
JACQUES 7910	9.7	.	.	.	.	.	.	.	.	.
CAVERNDALE FM. CF6065	9.6	.	.	.	.	.	.	.	.	.
AGRATECH 888	9.6	.	.	.	.	.	.	.	.	.
FUNK'S EX7051X	9.6	.	.	.	.	.	.	.	.	.
SPECIALTY GRAINS SGI 1300	9.6	.	.	.	.	.	.	.	.	.
CALLAHAN C781	9.6	.	.	.	.	.	.	.	.	.
ZIMMERMAN Z14W	9.5	.	.	.	.	.	.	.	.	.
THE NEW N-K C8625	9.5	.	.	.	.	.	.	.	.	.
COLBERT 313	9.5	.	.	.	.	.	.	.	.	.
GOLDEN ACRES GA8559	9.5	.	.	.	.	.	.	.	.	.
JADER 316	9.5	.	.	.	.	.	.	.	.	.
SO. STATES SS907	9.5	.	.	.	.	.	.	.	.	.
SPECIALTY GRAINS SGI 3100	9.5	.	.	.	.	.	.	.	.	.
SUPER CROST EX7219	9.5	.	.	.	.	.	.	.	.	.
UNITED AGRI PROD. UAPX5002	9.5	.	.	.	.	.	.	.	.	.
ZIMMERMAN Z20	9.5	.	.	.	.	.	.	.	.	.
ADLERS 88X	9.4	.	.	.	.	.	.	.	.	.
DEKALB-PFIZER DK711	9.4	.	.	.	.	.	.	.	.	.
GLICK SEED GH75X	9.4	.	.	.	.	.	.	.	.	.
ZIMMERMAN Z36	9.4	.	.	.	.	.	.	.	.	.
HUBNER SEED H3315	9.4	.	.	.	.	.	.	.	.	.
JACOBI 6901	9.4	.	.	.	.	.	.	.	.	.
STEWART HYBRIDS 9012	9.4	.	.	.	.	.	.	.	.	.

COOPERATIVE EXTENSION SERVICE
U.S. DEPARTMENT OF AGRICULTURE
UNIVERSITY OF KENTUCKY
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Table 2. Continued.

NAME	ANNUAL 3 LOCATION AVERAGES				MULTIPLE YEAR AVERAGES					
	1990	1991	1992	1993	4 YEAR 90-93	3-YEAR 91-93	2-YEAR 92-93	3-YEAR 90-92	2-YEAR 91-92	2-YEAR 90-91
SEEDEX 1155	9.4	.	.	.	.	.	.	.	.	.
FUNK'S G-4543	9.3	.	.	.	.	.	.	.	.	.
GLICK SEED GH80X	9.3	.	.	.	.	.	.	.	.	.
CALLAHAN C773A	9.3	.	.	.	.	.	.	.	.	.
STEWART HYBRIDS 37L3L	9.3	.	.	.	.	.	.	.	.	.
HYPERFORMER HS9911	9.3	.	.	.	.	.	.	.	.	.
JACOBI 6780	9.3	.	.	.	.	.	.	.	.	.
STEWART HYBRIDS 8432	9.2	.	.	.	.	.	.	.	.	.
BO-JAC 601	9.2	.	.	.	.	.	.	.	.	.
JACOBI 6720	9.2	.	.	.	.	.	.	.	.	.
PIONEER BRAND 3343	9.2	.	.	.	.	.	.	.	.	.
JADER 115	9.2	.	.	.	.	.	.	.	.	.
MCCURDY 7660	9.1	.	.	.	.	.	.	.	.	.
CARGILL 9427	9.0	.	.	.	.	.	.	.	.	.
ORO HYBRIDS ORO180	8.9	.	.	.	.	.	.	.	.	.
ORO HYBRIDS ORO188	8.9	.	.	.	.	.	.	.	.	.
UNITED AGRI PROD. UAPX5003	8.9	.	.	.	.	.	.	.	.	.
AVERAGE	9.5	10.1	8.5	8.6	9.1	9.0	8.5	9.3	9.3	9.8
L.S.D. (0.10)	0.4	0.6	0.6	0.6	0.3	0.3	0.3	0.3	0.3	0.3

Morris J. Bitzer
Extension Grains Specialist