

High Yields of Corn Per Acre

Results of a Statewide Corn-Growing
Demonstration in Kentucky, 1946

By W. C. JOHNSTONE

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Thomas P. Cooper, *Dean and Director*

OVER 2,000 FARMERS in 87 counties took part in the 1946 "Kentucky Corn Derby," a program planned to arouse general interest in high corn yields and to bring out the practical ways of producing more corn per acre. A state average of 40 bushels of corn per acre was set as a goal to be reached in Kentucky by 1960. In only two previous years (1942 and 1945) had the Kentucky average been as high as 30 bushels per acre.

The 10 High Yields in Each Class

Yields in these corn-growing demonstrations were checked by county committees, according to instructions issued by the Extension Division of the College of Agriculture and Home Economics, University of Kentucky, and were based on 14½ percent moisture content. Of the total participants, 401 had yields of 100 bushels or more per acre. The 10 high producers in each class, and their yields, were as follows:

1-Acre Class			5-Acre Class		
Name	County	Yield bus.	Name	County	Yield bus.
W. A. Scott,	Carlisle	164.0	Everett Simpson,	Bullitt	155.1
Wm. Ray York,	Jackson	163.3	Sammy Winders,	Crittenden	147.0
Ernest Smith,	Russell	161.5	Mark Greenwell,	Union	144.2
Wm. Luther Sturgill,	Jackson	153.3	John Moser,	Oldham	141.7
Willie Shephard,	Magoffin	151.2	G. C. Wilson,	Davies	141.2
Herbert Wilson,	Owsley	149.7	Carl Chaney,	Warren	140.2
John C. Overstreet,	Boyle	149.6	Karl Moser,	Jefferson	137.1
P. E. Hughes,	Marion	149.4	Milford Napier,	Harlan	135.2
Homer Riley,	Jackson	149.2	Stark Bros.,	Nelson	134.5
Joe Grant Neal,	Johnson	147.3	Willis Stout,	Jefferson	134.0

How the High Yields Were Grown

Fertile soil, plenty of moisture, and good seed of high-yielding kinds, enough plants per acre, and level land or moderate slopes farmed on the contour accounted for the high yields in the 1946 corn growing demonstration.

Fertile soil

For corn production the soil must have plenty of humus and of plant foods. Though fertility involves more than amount of commercial fertilizer used, there was a close relation between amount of fertilizer used and yield. In Simpson county, for example, the 10 high producers, who averaged 114 bushels per acre used an average of 798 pounds of fertilizer per acre. The 10 low producers, on the other hand, averaged 55 bushels per acre and 205 pounds of fertilizer per acre. In McCracken county a prize offered for the greatest increase in yield was won by a 4-H club boy who produced 65 bushels on an untreated check acre and 135 bushels on his treated acre. The treated acre was fertilized with 500 pounds of 47-percent triple superphosphate, 200 pounds of ammonium nitrate, and 50 pounds of muriate of potash, and in addition a cover crop of vetch and rye was turned under and 10 loads of manure were spread.

Conservation of moisture

Without enough moisture a high corn yield is impossible. A farmer can do nothing to control rainfall, but he can do much to control the water after it falls. Farming practices affect both the ability of the soil to hold moisture and the rate and amount of water run-off. Practices that build up fertility help to hold moisture. Fertile soils do not suffer from drouth as soon or as much as infertile soils, and humus soils hold moisture better than soils lacking in humus. Early rather than late plowing (unless a cover crop is to be turned under), thorough preparation of the seedbed, and shallow cultivation are all moisture-saving practices. On land with more than a 2-percent slope, plowing, planting, and cultivating on the contour save run-off water, letting it soak into the soil. This increases corn yields 6 to 8 bushels an acre in most seasons. Terracing also saves water. Of the 244 entrants in 1946 who planted corn on sloping land, 113 used contour cultivation and 12 had terraces also.

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Kind of corn planted

All but 7 of the 401 growers who produced 100 or more bushels of corn per acre in the 1946 demonstration used hybrid corn. Of those who used hybrids, 327 used Kentucky-grown seed, practically all of which was certified, and 67 used closed-pedigree hybrids.

Number of plants per acre

For the highest yields, corn must be planted thick enough to make full use of plant food and moisture. This was made clear in the 1946 demonstrations. When the records were grouped according to number of plants per acre the average yields were as follows:

<i>Stalks per acre</i>	1-Acre Class		5-Acre Class	
	<i>Bushels per acre</i>	<i>Number reporting</i>	<i>Bushels per acre</i>	<i>Number reporting</i>
Under 8,000	78.4	169	82.1	64
8-10,000	95.8	200	95.9	100
10-12,000	106.6	163	106.6	45
12-14,000	115.3	67	115.7	23
Over 14,000	121.8	38	122.7	8

It should be remembered that the high-yield plots were very fertile. Without high fertility it is useless to have a high plant population per acre. Some plots in the 1946 demonstrations had too many plants for the fertility and moisture of the soil. Nevertheless it is clear from the results that a large majority of Kentucky farmers who have been building up the fertility of their soil and are growing adapted hybrids, have too few plants per acre to make full use of fertility and moisture in an average season. In the demonstrations this year, a large number of plants per acre with relatively small ears made higher yields than fewer plants with larger ears.

Choice of land for corn

By choosing well-lying land, building up its fertility, using good farming practices, and planting adapted hybrid seed, farmers generally can raise more corn on fewer acres. Especially in the mountain counties, entrants in the 1946 corn demonstrations grew on good land, properly drained, fertilized, and cultivated, 8 to 10 times as much corn per acre as the average in the county. In Owsley county, for example, Herbert Wilson produced 149.7 bushels per acre on his bottomland acre, and the better-drained part of this plot produced at the rate of almost 200 bushels per acre. Yields of corn on

typical hillsides in the county were generally under 20 bushels per acre, as checked by County Agent H. M. Williams.

Do High Corn Yields Pay?

In 1946 the Kentucky Agricultural Experiment Station studied the cost of producing corn in 5 counties, comparing records of 65 entries in the 5-Acre Class in the corn-growing demonstrations and on 44 other farms not entered in the demonstrations but considered to be typical. Corn yields on the 5-acre demonstrations on the 65 farms averaged 85 bushels per acre and on the 44 typical farms the yields averaged 47 bushels per acre. The high-yield group used 3 times as much fertilizer and had 50 percent more plants per acre. More of their corn (62 percent as compared with 27 percent for the low-yield group) was on level upland or bottomland and more of them used hybrid seed. Most of the land in both groups had been limed. Very little manure was used on the land in either group. Weather in all the counties during the growing season was very favorable for corn production.

Some of the production figures on these farms were as follows:

<i>Averages</i>	<i>5-Acre Demonstration (65 Farms)</i>	<i>Typical Farms (44 Farms)</i>
Corn yield per acre, bushels	85	47
Value of corn per acre, at \$1.25 per bushel ..	\$106.25	\$58.75
Total cost of production per acre	33.32	22.58
Difference between value and cost per acre	\$72.93	\$36.17
Number of plants per acre	8,577	5,772
Fertilizer nitrogen used, pounds per acre	28	3
Phosphoric acid used, pounds per acre	78	31
Potash used, pounds per acre	17	7
Cost per acre for fertilizer and manure (included in total cost, above)	\$17.02	\$5.05
Bushels corn produced per hour of man labor	5.1	2.3
Cost of production, per bushel (not including charge for use of land or cost of cover crops)	39.5 cents	48 cents

Yes, it pays to produce high yields of corn. Forty-seven bushels per acre is a "good" yield of corn in Kentucky, well above the state average in 1946. Yet on these 109 farms it cost 8.5 cents less per bushel, on the average, to produce 85 bushels per acre than to produce 47. Figuring the corn at \$1.25 a bushel, returns above total

costs were \$47.50 more per acre, on the average, on the high-yielding farms than on the lower-yielding farms.

High yields also pay in other ways. By growing more corn on fewer acres a farmer can rearrange his cropping system to best advantage, growing on each kind of land the crops best suited to it. And by growing more corn per hour of man labor used on the crop he can have more time for other enterprises. Higher yields per acre and per hour of work bring the opportunity for expansion in the total volume of farm business.

In practically all businesses two of the most important factors in determining success are (1) volume of business and (2) cost per unit. Higher yields per acre and per hour of work combined with lower cost of production per bushel are sure to mean more profitable farming.

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