Produce High Yields of Corn

Circular 506

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Cover photo

His 1951 record yield of 233.2 bushels of corn on an acre is ample proof that Cledith Rowe, the Magoffin County youth whose picture is on the front cover, is following practices which "Produce High Yields of Corn". This crop was grown on creek bottomland which was built up by J. H. Rowe, Cledith's father, from a production level of less than 20 bushels per acre.

The general cropping system includes an annual cover crop of vetch and rye which is turned under as green manure. Fertilizer for the record crop included 282 pounds of nitrogen (N), 312 pounds of phosphate (P_2O_5), and 420 pounds of potash (K_2O). Seed of two adapted varieties was planted, the mixture containing mostly US 523W. The total plant number was about 24,700 stalks.

Cledith and his father entered the Kentucky Corn Derby every year since its organization in 1946 and averaged a yield of 156.7 bushels per acre through 1952—a fine record of continued high production.

Produce High Yields of Corn

Prepared by members of the Agronomy Department

Corn is an important crop in Kentucky. It has high cash or feeding value and it yields well. Also, it fits in well with other farm enterprises.

Corn is produced economically with the usual farm labor and machinery if the land is suitable and when proper cultural and fertilizer practices are followed. However, because of low yields on many farms and the rolling topography of much land on which corn is grown, it often is costly to produce and also is costly in erosion.

Much can be done to improve corn production in Kentucky. It is not difficult in seasonable years to produce 100 bushels or more of corn per acre. A high yield increases profits. With high yields, also, more corn is produced on fewer acres, and the need is reduced for growing corn on sloping land where soil erosion is difficult to control.

The following five points are considered the most important in obtaining high yields of corn in Kentucky.

Grow Corn in a Cropping System Fitted to the Land

Growing corn on hilly land is likely to cause great loss of soil and result in low yields of corn and succeeding crops. When corn is grown on sloping land, contour tillage and often terraces are necessary to control erosion. This method of tillage checks run-off water on such land and saves both fertile topsoil and water. In planning to increase corn yields, it is important, therefore, to choose suitable land and to use the needed practices to maintain and build up the fertility of the soil.

On most upland in Kentucky, corn should be grown in rotation with small grain and one or more years of grass-legume hay or pasture crop. The more sloping the land and the greater the erosion tendency, the longer the land should remain in the sod crop.

On farms with but little land that is level to gently sloping,

it may be desirable to use an intensive 2-year rotation of corn and small grain on this better lying land. Sweet clover or Korean lespedeza, or both, should be seeded in the small grain to improve the soil and provide nitrogen for the nonlegume crops.

On overflow soils corn may be grown continuously or in rotation with soybeans.

On rolling to hilly upland used principally for hay and pasture, corn may be grown when it is desirable to plow and reestablish a sod, provided that proper conservation practices are followed.

On sloping land, it is important to prevent soil erosion during the winter after corn. This is done fairly effectively when the stalks are left on and are broken down across the slope by a mechanical picker or by dragging. A small-grain or other cover crop seeded early enough and fertilized so as to make good growth in the fall helps to prevent erosion and also prevents some fertility losses by leaching.

Fertilize Efficiently

Soil fertility greatly influences corn yields. How corn should be fertilized varies with the natural fertility of the soil and with past cropping and management of the land. Soils for corn should be slightly acid to neutral, so that the soil-improving legumes will grow well. They should be well supplied with available nitrogen, phosphorus (phosphate) and potassium (potash). When corn is grown in rotation with a small grain and a grass-legume sod crop, most of the phosphate and much of the potash used in the rotation should be applied on the small-grain crop.

It is impossible here to give specific recommendations for fertilizing corn for all conditions in the state, but the following should prove generally useful:

(A) Corn grown in a rotation of corn, small grain, and 1 to 2 years of a grass-legume hay or pasture crop:

Apply on small grain:
600 to 800 pounds per acre of 0-14-7, 4-12-8, or 4-16-8 or equivalent plant food in other mixed or straight fertilizers.

Apply for corn:

1. No manure, 400-600 pounds per acre of 8-8-8 or equivalent plant food in other mixed or straight fertilizers.
2. Eight or more tons of farm manure per acre, no fertilizer needed.

(B) Corn grown on level to gently sloping land in a 2-year rotation of corn and small grain with sweet clover and/or Korean lespedeza seeded in the small grain

Fertilize the same as in "A" except that on the small grain apply 500 to 600 pounds per acre of 4-12-8 or 4-16-8 or equivalent plant food in other straight or mixed fertilizers.

(C) Corn not grown in a definite rotation and when fertilizer has not been applied to the field within a 4-year period

1. No manure, 800-1000 pounds per acre of 8-8-8 or equivalent plant food in other straight or mixed fertilizers.
2. Eight to ten tons of farm manure per acre, 400-500 pounds per acre of 8-8-8 or equivalent plant food in other mixed or straight fertilizers.

(D) Corn grown frequently or continuously on overflow soils

Apply 400 to 600 pounds per acre of 8-8-8 or equivalent plant food in other mixed or straight fertilizers.

Phosphorus is not needed in fertilizers for corn on the moderate to high phosphate soils of the Bluegrass region and the overflow soils of the Ohio, Mississippi, Tennessee, and Lower Cumberland rivers. On these soils nitrogen and potash may be applied in straight fertilizers equivalent to the respective amounts in the fertilizer applications stated above for the appropriate cropping system.

Small to moderate fertilizer applications are usually more effective applied at the row or hill. To avoid injury to seedlings apply not over 600 pounds per acre along the row, or if corn is check-planted and fertilizer applied at the hill, not over 300 pounds in this way. The fertilizer should be placed so as not to be in contact with the seed. Direct contact of seed and fertilizer may injure enough seedlings to reduce the stand materially.

When fertilizer is applied more heavily than is mentioned above, only a part or even none need be applied at the row. Part or all may be applied broadcast. It may be disked in deeply

after plowing, or broadcast before plowing and plowed under when this is done after the first of April.

If nitrogen deficiency develops in the plants, it should be profitable to apply a nitrogen fertilizer any time before the last cultivation. One hundred to 200 pounds per acre of ammonium nitrate or equivalent nitrogen in other nitrogen fertilizers may be applied. If applied by hand, care should be taken to keep the fertilizer off the leaves.

Symptoms of nutrient deficiency

Nitrogen: light green to yellow color beginning along midvein in lower leaves and progressing up the stalk, "firing" in dry weather.

Potassium: yellowing and dying of edges of leaves, "leaf scorch."

Phosphorus: purpling of leaves, more likely in some varieties than in others. Purpling, however, also may result from other unfavorable growth conditions.

Chemical soil tests will furnish useful information on the lime, phosphate, and potash needs of soils for production of corn and other crops. Consult your county agent about these tests.

The purchase of fertilizers and their use on field crops is discussed more fully in Circular 70.

Use a Proven Adapted Hybrid

Corn hybrids vary in their yielding ability, lodging resistance, maturity, and other qualities. The use of Kentucky certified hybrid seed is the best assurance of getting an adapted hybrid. The following hybrids are recommended for Kentucky:

Yellow—Ky 103, Ky 102, US 13, and Ind. 844D

White—Ky 203, Ky 405B, US 523W, and Ind. 750B

Indiana 844D is the earliest of the yellow hybrids. Closely related to US 13, it is a few days earlier and not quite so productive.

US 13 is a low-growing, early hybrid with excellent roots and strong stalks, and it produces attractive ears. It seems to be somewhat more susceptible to leaf diseases in eastern Kentucky than Ky 102 or Ky 103. It is recommended where planting is

delayed or where it is desired to get the corn crop off early to sow the land to a cover crop.

Ky 103 is becoming one of the most popular hybrids in Kentucky. It is slightly taller than US 13 and reaches maturity about 3 days later.

Ky 102 is the latest maturing yellow hybrid. It produces well on soils with high fertility and moisture, but stands up poorly. It is a vigorous grower, has tall leafy stalks with plenty of foliage, and is recommended as a silage corn. Ears are long, tapering, and quite resistant to ear-worm and other insect damage. It is an excellent hybrid for those wishing to produce a good crop as well as an excellent fodder.

Though the yellow hybrids usually mature earlier than whites and are higher in feeding value because of their carotene and vitamin-A content, demand for white corn is increasing. White hybrids normally produce higher yields and sell at a higher price because of increasing demand for milling purposes.

Indiana 750B is a low-eared, early maturing white hybrid which yields well and stands up well for mechanical harvesting. It does well under moderate moisture and fertility conditions.

Ky 203 is a medium early vigorous grower, has a strong stalk, and yields well. It is a good fodder producer, and is dependable on a wide range of soils.

Ky 405B is slightly later in maturity than Ky 203 by virtue of holding its green color longer. It stands well and carries the ears low on the stalk. However, it is not planted extensively because of seed production difficulties.

US 523W, certified since 1950, is gaining wide acceptance in Kentucky and several adjoining states. It is a high-yielding hybrid with an excellent stalk, is low eared and well adapted to mechanical harvesting. It is similar in maturity to Ky 203, but has a somewhat harder grain.

Get a Good Stand

The best yields of corn are made only where there are enough plants to fully utilize the plant food and moisture available in the soil. The right number of plants varies with the fertility of the soil. On soils of very high fertility capable of producing over

100 bushels per acre, 15,000 plants are needed for the highest yield. On soils of moderate to low fertility, capable of producing less than 50 bushels per acre, 7,500 plants are enough. In the table below is shown what is regarded as the best spacing of plants in rows 3½ feet apart for producing highest yields of hybrid corn on soils of different fertility levels.

Estimated yield	*Distance between plants, drilled corn*	*Approximate number of plants per acre*
Below 50 bushels	20 inches	7,500
50-80 bushels	15 inches	10,000
80-100 bushels	12 inches	12,500
Over 100 bushels	10 inches	15,000

If rows are spaced closer than 3½ feet, distance between plants in the row should be increased accordingly. About the same number of plants per acre should be grown where corn is planted in hills. Three plants per hill in hills 3½ feet apart each way equals approximately 10,500 plants per acre.

Good stands are obtained by good seedbed preparation, use of efficient machinery, care in planting, good seed, and control of seedling insects and diseases. Most certified seed corn is well graded and treated for seedling diseases. Corn should not be planted until a proper seedbed can be prepared and until the soil is warm enough to cause the corn to sprout within one week.

Control Weeds

Weeds in corn compete with the crop for both moisture and plant food. Good preparation of the seedbed and early cultivation of the crop are essential to control weeds. The vigorous growth of a thick stand of corn on fertile land should make frequent and late cultivations unnecessary. Cultivation in general should be shallow to avoid cutting the roots of the corn, and no more than enough to control weeds.

Supplemental control with herbicides may be advisable where broadleaf weeds compete with corn for moisture and plant food.

Lexington, Kentucky
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