

Corn for Grain & Silage

Marketing

Field corn (*Zea mays*) grown in Kentucky is used mainly for livestock feed. It is produced for both on-farm use and off-farm sale. There are a variety of local and regional markets for corn in Kentucky, such as local grain elevators.

Market Outlook

The primary use of field corn for grain and silage in the United States is for livestock feed. Other uses are industrial (sweeteners) and energy (ethanol). U.S. producers face international competition in the livestock category; corn prices have fluctuated greatly in recent years. Expanded corn markets, as well as the emergence of more uses for corn, could help stabilize future prices.

Production Considerations

Site selection and planting

Corn does well on a wide variety of soils, but performs best on silt loam soils that are well drained, in good tilth, and free from erosion. No-tillage techniques, pioneered by farmers and researchers in Kentucky, are now so widely used in-state that they dominate seeding methods for corn. No-till is best suited to soils that are moderately well-drained to well-drained.

Avoiding droughty soils and following a good crop rotation program is recommended. Standard crop rotations often include corn-soybean or corn-wheat-soybean rotations. Optimum planting dates usually range from the first of April to mid-May in Kentucky.



Early-planted corn has fewer disease and insect problems, plus it generally out-yields late-planted corn.

Seeding rates depend on the tillage system (conventional or no-till) and use (silage or grain). If there is uncertainty as to whether the crop will be harvested for grain or silage, the field should be seeded at the rate recommended for grain. Recommended seeding rates for grain corn are from 22,000 seeds per acre for low-yielding soils to 30,000 seeds per acre for high-yielding soils. If the crop is for silage only, then seeding rates should be closer to 30,000 seeds per acre.

Pest management

Flea beetles, cutworms, corn borers, and corn earworms are the major insect pests of corn. Potential disease problems include damping-off, gray leaf spot, stalk rots, and viruses. Crop rotation, seed treatment, and the use of resistant varieties can help reduce disease and insect problems. Foliar insecticide and/or fungicide sprays typically do not show justifiable economic



returns for commercial corn production. Weed control can be achieved by a good crop rotation program and the use of herbicides.

Harvest and storage

The best time to harvest corn for high quality silage is when the kernels are at 1/2 to 3/4 milk line. Crude protein and digestibility are higher at this point.

Some farmers wait to chop corn for silage when the kernels have all dented and a black layer has formed near the base of the kernel. Chopping corn at black-layer results in higher yields than chopping corn at 3/4 milk-line; however, crude protein and digestibility are lower. The silage should be chopped at a length of approximately 3/8 to 1/2 inch to ensure adequate packing. Excluding air is of major importance in making and preserving silage.

When the kernels reach black-layer (also known as physiological maturity) corn kernels are at about 30 to 35 percent moisture. Harvesting corn for grain usually occurs after the kernel moisture is below 25 percent. Kernels need to be dried to 16 percent moisture within 24 hours after harvest and should be cooled to outside air temperatures within 48 hours after harvest for safe storage.

Labor requirements

Labor needs are approximately 2 to 4 hours per acre for production and harvest, depending on equipment size and production system. Silage production will require slightly more labor than grain production.

Economic Considerations

Initial investments include land preparation and the purchase of seed. Total 2009 variable costs for no-till corn silage are estimated at \$400 per



acre. Harvest amounts can range from 12 to 20 tons per acre with prices between \$15 and \$30 per ton. A break-even price of \$26.77 per ton would be needed to cover variable costs of a 15-ton per acre harvest. The total cost of producing 15 tons of silage per acre for on-farm use was estimated at about \$29 per ton for 2009.

A 2009 estimate for costs of no-till corn for grain totaled \$469 per acre. Presuming a harvest of 130 bushels per acre sold off-farm at \$4 per bushel, gross returns of \$520 can be expected. With this scenario, returns to land, capital, and management would come to approximately \$109 per acre. A break-even price of \$3.29 per bushel would be needed to cover variable costs of a 130-bushel per acre yield.

Selected Resources

- A Comprehensive Guide to Corn Management in Kentucky, ID-139 (University of Kentucky, 2001)
<http://www.ca.uky.edu/agc/pubs/id/id139/id139.htm>
- Corn and Soybean Budgets (University of Kentucky, 2009)
[http://www.ca.uky.edu/cmsspubsclass/tinymce/jscripts/tiny_mce/plugins/filemanager/files/ghalich/Corn%20and%20Soybean%20Budgets%20\(Kentucky%202009\).xls](http://www.ca.uky.edu/cmsspubsclass/tinymce/jscripts/tiny_mce/plugins/filemanager/files/ghalich/Corn%20and%20Soybean%20Budgets%20(Kentucky%202009).xls)
- Grain Crops Extension Web site: Corn (University of Kentucky)
<http://www.uky.edu/Ag/GrainCrops/corn.htm>
- Harvesting Methods for Corn Silage Affect Performance (University of Kentucky)
<http://www.uky.edu/Ag/AnimalSciences/dairy/extension/nut00019.pdf>
- Important Steps When Harvesting Corn Silage (University of Kentucky)
<http://www.uky.edu/Ag/AnimalSciences/dairy/extension/nut00114.pdf>
- Kentucky Integrated Crop Management Manual for Corn (University of Kentucky, 2009)
<http://www.uky.edu/Ag/IPM/manuals/ipm2corn.pdf>

- Producing Corn for Silage, AGR-79 (University of Kentucky, 2006)
<http://www.ca.uky.edu/agc/pubs/agr/agr79/agr79.pdf>
- Agronomy Handbook—Chapter 2: Corn (University of Illinois)
<http://iah.ipm.uiuc.edu/index.php?ch=ch2/>

- Introduction to Field Corn Production and Management (eXtension, 2008)
http://www.extension.org/pages/Introduction_to_Field_Corn_Production_and_Management
- Organic Field Corn Production (ATTRA, 2002)
<http://attra.ncat.org/attra-pub/fieldcorn.html>

Field corn photo by Howard F. Schwartz, Colorado State University, courtesy of Bugwood.org; Farm photo by Matt Barton and Steve Patton, courtesy of UK College of Agriculture—Ag Communications Services

*Issued 2003
Revised May 2009*

For additional information, contact, your local [County Extension](#) agent