

Wheat

Introduction

Wheat, a cereal grain in the grass family, is the fourth most valuable cash crop grown in Kentucky. Current intensive management technology has made it possible for growers to produce a high quality, high-yielding crop. Wheat production is mechanized; with the exception of scouting, little-to-no handwork is involved with this crop. Despite significant acreage already dedicated to wheat production, additional opportunities continue to be available to make profitable returns. Most wheat grown in the Commonwealth is soft red winter wheat (*Triticum aestivum*) which is used in cakes, pastries, cookies, crackers, and cereals.

Marketing

Wheat is most commonly marketed in Kentucky as a commodity grain crop for flour production. Producers must meet minimum quality standards for wheat delivered for processing at flour mills such as Siemer Milling in Hopkinsville. This flour is delivered by mills to bakers and food manufacturers, such as Continental Mills in Hopkinsville, where the flour is used in ready-to-make baking mixes and food product ingredients. Wheat may also be sold to local grain buyers or may be stored on the farm for future marketing or use as animal feed. A small amount of Kentucky wheat is processed and marketed by growers directly to consumers.

Market Outlook

Wheat is a basic food ingredient worldwide with steady demand. Wheat prices increased along



with prices of other commodity crops (corn, soybeans) during the 2000s. Improvements in wheat varieties have increased per acre yields, helping offset higher input prices. Many grain price risk management strategies, such as the use of different types of grain marketing contracts, are well-established for reducing price risks in wheat marketing.

Production Considerations

Site selection

Wheat prefers well-drained, loamy soils and will not tolerate waterlogged conditions. Yields are reduced when wheat is grown on moderately or somewhat poorly drained soils.

Variety and seed selection

Yield potential, disease resistance, maturity, and lodging resistance are the critical considerations in cultivar selection. Growers need to be aware of the most commonly occurring diseases on their farm or locale, and then select several high-yielding varieties that have complementary disease resistance and maturity. Cultivars that have performed well during multiple years and



over a range of conditions are likely to perform well again. Refer to the UK Small Grain Variety Testing Program Web site for more information.

Purchase certified seed or seed of proven high quality from an established, reputable dealer. Seed treatment fungicides are used on nearly all wheat seed purchased in Kentucky.

Cropping systems and planting

Most wheat grown in Kentucky is produced in a rotation of three crops in 2 years. A spring-planted corn crop is followed by winter wheat seeded in October; once the wheat is harvested in June or July, it is followed by soybeans as a second crop (double cropping). A winter fallow then follows the soybean harvest. A few farms replace the winter fallow with canola.

An alternative rotation plan consists of full season soybeans, followed by a fall planting of wheat; soybeans are double cropped once the wheat is harvested. The field is left fallow the winter following the soybean harvest.

Wheat can be grown using conventional tillage, reduced tillage, or no-till systems. In a full or conventional tillage system, a smooth, level seed bed is prepared prior to planting. In contrast, seed is planted into the residue of the previous crop in reduced tillage and no-till systems. Conservation tillage systems have the advantage of reducing soil erosion, equipment requirements, labor costs, and fuel costs.

Regardless of tillage method, seed is usually planted with a grain drill. Seed placement is especially critical in no-till systems since the seed must be placed at the proper depth so it comes into direct contact with the soil below the plant residue. Variable planting depths will result in uneven stands. The optimal planting window for winter wheat in Kentucky is between October 10 and October 30.

Pest management

The potential for disease and insect outbreaks can

be reduced by using multiple strategies, including crop rotation, delayed and/or staggered planting dates, resistant varieties, varying maturity types, proper fertility, seed treatment fungicides, and timely harvest. Field scouting is essential for an integrated pest management approach. Insecticide and fungicide spray decisions should be based on field scouting results, not on the calendar or wheat growth stages.

Fungal diseases that can cause yield losses include Fusarium head blight or head scab, Stagonospora leaf and glume blotch, powdery mildew, leaf rust, stripe rust, and take-all. Barley yellow dwarf virus can cause significant losses during some years. Common insect pests include Hessian fly and aphids. Armyworm and cereal leafbeetle are also common, but rarely result in economic losses.

Harvest and storage

Wheat is typically harvested when the grain is at 13 to 15 percent moisture. It is possible to harvest at higher moisture levels provided drying facilities are available. High moisture grain must be quickly dried to prevent sprouting and spoilage. High speed dryers and bin drying equipment can be used.

Double cropping provides an incentive for an earlier wheat harvest in the form of increased yields and greater profits from the second crop. Early wheat harvest has other advantages: fewer weather-related delays, increased yields due to the higher test weight, and less shattering during combining.

It is common for wheat to be held in on-farm storage for 12 months or longer. The primary causes of grain spoilage in Kentucky are excess moisture and high temperature during the summer. Additionally, any grain improperly handled or stored longer than 6 months can be infested by insects. Sanitation and aeration are the keys to maintaining grain quality in storage. Grain should be inspected regularly for evidence of mold and insect infestations.

Labor requirements

Labor requirements for wheat will vary according to the number of acres produced, size of equipment, and production system. For no-till wheat production, labor needs per acre are usually about 1 hour for production and less than 1 hour for harvest and marketing. Tilled wheat production may require more than 1 hour per acre for production. Harvesting straw will add more labor hours per acre.

Economic Considerations

Initial investments include land preparation and purchase of seed.

Production and harvest costs for no-tilled wheat are estimated at about \$355 per acre, including land rent. Total expenses per acre, including variable, fixed, and land rent, would come to approximately \$390. Assuming gross returns of \$490 per acre, returns to management would be approximately \$100 per acre.

Since returns vary depending on actual yields and market prices, the following per acre estimated returns to management are based on three different scenarios. Conservative estimates represent the University of Kentucky's cost and return estimates for no-tilled wheat in 2012.

<i>Pessimistic</i>	<i>Conservative</i>	<i>Optimistic</i>
\$(27)*	\$98	\$196

**Parentheses indicate a negative number, i.e. a net loss*

Selected Resources

- Comprehensive Guide to Wheat Management in Kentucky, ID-125 (University of Kentucky, 2009)
<http://www.ca.uky.edu/agc/pubs/id/id125/id125.htm>
- Crop Profile for Winter Wheat in Kentucky (USDA Southern IPM Center, 2010)
<http://www.ipmcenters.org/cropprofiles/docs/KYwheat.pdf>
- Importance of Scouting Wheat for Plant Diseases, PPFS-AG-SG-12 (University of Kentucky, 2011)
http://www.ca.uky.edu/agcollege/plantpathology/ext_files/PPFShtml/ppfsagsg12.pdf
- Integrated Crop Management for Small Grains, IPM-4 (University of Kentucky, 2011)
<http://www.uky.edu/Ag/IPM/manuals/ipm4smgr.pdf>
- IPM in Kentucky Stored Grain (University of Kentucky)
<http://www.ca.uky.edu/entweb/storage/open.html>
- Kentucky Small Grain Growers Association
<http://www.kysmallgrains.org/>
- No-Till Small Grain Production in Kentucky (University of Kentucky, 2000)
<http://www.ca.uky.edu/agc/pubs/id/id136/id136.htm>
- Small Grain Variety Testing Program (University of Kentucky)
<http://www.uky.edu/Ag/wheatvarietytest/>
- Small Grains Web site (University of Kentucky)
http://www.uky.edu/Ag/GrainCrops/small_grains.htm
- Wheat and Wheat Double-crop Soybean Budget (University of Kentucky, 2012-2013)
<http://www.ca.uky.edu/agecon/index.php?p=29>

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Photo courtesy of Matt Barton, UK Ag Communications

October 2012

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