UK COOPERATIVE EXTENSION SERVICE
UNIVERSITY OF KENTUCKY — COLLEGE OF AGRICULTURE

Specialty Field Corns

Introduction

This profile discusses some of the types of special purpose field corn (*Zea mays*) that are harvested for grain and sold for animal feed, industrial use, or human consumption. These specialty corns have been genetically altered to improve their starch, protein, or oil content, depending on their intended use.

HIGH-AMYLOSE corn has an amylose content greater than 50 percent. It is grown exclusively for wet milling in the production of textiles, gum candies, biodegradable packaging materials, and adhesives. A very limited acreage of high-amylose corn is currently being grown in Kentucky.

WAXY corn is a starch variant of normal dent corn. It is processed by wet millers in the production of waxy cornstarch for industrial and food purposes. University of Kentucky researchers are also proposing to examine its use as an animal feed since the starch in waxy corn is more easily and completely digested by livestock than the starch in standard dent corn.

HIGH-LYSINE corn has an increased concentration of lysine (a protein source), thus improving the nutritional quality of the grain. It is primarily used in the U.S. as feed for non-ruminants. Currently only a few swine producers are raising high-lysine corn in Kentucky.

HIGH-OIL corn contains approximately 7 to 8 percent oil, compared to 2 to 3 percent for standard hybrids. The added oil makes it a high energy feed. Several thousand acres of high-oil corn are contracted each year in Kentucky. While primarily an animal feed, high-oil corn is also a source of oil for margarine and cooking oil.

LOW-PHYTATE corn hybrids have a high phosphorus utilization in comparison with other corns. This results in less phosphorus excreted by the animal, and thus, less phosphorus released into the environment. This specialty corn is mainly intended as feed for hogs.

Marketing and Market Outlook

Special purpose corns are usually grown under contract at a price premium. The processor will generally specify both the hybrids to be planted and the number of acres. Specialty corns may also be sold on the open market. There are a number of markets for specialty corns in surrounding states, such as Illinois, Indiana, and Missouri.

Production Considerations

CENTER FOR CROP DIVERSIFICATION

Site selection and planting

Corn will do well in all areas of Kentucky, but well-drained soils are essential for good

results. No-tillage techniques, pioneered by farmers and researchers in Kentucky, are now so widely used in-state that they dominate the seeding methods for corn. 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. Specialty corns typically have lower stress tolerance and yield potential than standard dent corn. Specialty corn should be seeded between 24,000 and 28,000 seeds per acre depending on productivity of the field.

While production practices for specialty field corns are similar to those of standard dent corn, it is important to know the contract requirements before the special purpose corn is grown. There may be certain production management practices recommended to obtain the highest possible yield while maintaining grain quality. These might include fertility, population, and planting date, as well as harvest, drying, and handling practices.

The grain identity of specialty corns must be preserved from planting through storage to avoid contamination that would eliminate premium prices and decrease marketability. Special purpose corns also require isolation from other types of corn to eliminate cross-pollination. Isolation can be accomplished either by physical separation or by making sure there is a minimum of 14 days difference in the maturities of the different types.

Pest management

The major insect pests of field corn include flea beetles, cutworm, corn borer, and corn earworm. Scouting to monitor populations can help the grower determine when and how often insecticides should be applied. 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 problems.

Proper weed control is necessary for maximizing yield of specialty corns. Specialty corns may not grow as fast as dent corn and may take longer to shade between the rows. This delay in growth could favor late-germination of some weeds. Spray booms with drop nozzles may be needed to manage late-germinating weeds in specialty corns.

Harvest and storage

Specialty field corns are harvested at various moisture levels, depending on the type of corn and whether it is harvested on the ears or shelled. Harvesting with a rotary combine generally results in less damage to the kernels. Field drying is best; however, kernels may be machine-dried at low temperatures. Aeration is necessary for extended storage.

Labor requirements

Labor needs are approximately 2½ to 4 hours per acre for production and harvest, depending on production system and equipment size.

Economic Considerations

Initial investments include land preparation and the purchase of seed. Specialty corns have an inherently lower yield compared to normal dent corn hybrids. However, they can compensate for the reduction in yield potential with adequate premiums.

Total 2013 variable costs for no-till specialty field corn are estimated at $600 per acre. Presuming a harvest of 130 bushels sold at $7 per bushel, gross returns of $910 per acre would be expected. Returns to land, labor and management would be estimated at approximately $243 per acre.

Selected Resources

- Analyzing the Profitability and Risk of High-Oil Corn (University of Kentucky, 2000) http://www.uky.edu/Ag/AgEcon/pubs/ext_aec/ext2000-10.pdf

- Comprehensive Guide to Corn Management in Kentucky ID-139 (University of Kentucky) http://www.ca.uky.edu/agc/pubs/id/id139/id139.htm
- Corn and Soybean Budgets (University of Kentucky, 2013) http://www.ca.uky.edu/agecon/index.php?p=29
- Grain Crops Extension Web site: Corn (University of Kentucky) http://www.uky.edu/Ag/GrainCrops/corn.htm
- IPM in Kentucky Farm Stored Grain (University of Kentucky) http://www.ca.uky.edu/entweb/storage/open.html
- Kentucky Integrated Crop Management Manual for Corn (University of Kentucky 2009) http://www.uky.edu/Ag/IPM/manuals/ipm2corn.pdf
- Managing "Pollen Drift" to Minimize Contamination of Non-GMO Corn, AGF-153 (Ohio State University, 2003) http://ohioline.osu.edu/agf-fact/0153.html
- Specialty Corns: Waxy, High-Amylose, High-Oil and High-Lysine, AGF-112-91 (Ohio State University Extension, no year) http://www.ohioline.osu.edu/agf-fact/0112.html
- Specialty Corns for Value-Added Grain Production (University of Ohio, 2008) http://www.oardc.ohio-state.edu/hocorn/default.htm

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