Special Article

Biotechnology: U.S. Grain Handlers Look Ahead

Market prospects for genetically-modified crops are tinged with uncertainty. U.S. producers have rapidly increased acreage devoted to production of crops developed through biotechnology (biotech), which has the potential to increase yields and reduce pest management costs. However, some consumers in the U.S. and abroad—particularly the European Union—remain wary of the new technology despite reviews by the U.S. Food and Drug Administration that have determined that biotech foods currently in the market are safe for human consumption. As a result, grain handlers, food manufacturers, and others in the global marketing chain are attempting to balance the issue of divergent consumer demand with producers' desire to capture the cost-saving potential of biotech crops.

Although trade pattern changes arising from shifts in consumers' preferences have been quite modest so far, segregation of grain into biotech and nonbiotech may increasingly become a consideration. Questions are being raised about possible adaptations in the marketing system. What are the likely costs of large-scale segregation? How has the U.S. grain marketing system already responded to changing demands? And, how is the system likely to change in the future?

Consumer Preferences & Market Uncertainty

Adoption of biotech varieties has been rapid in the U.S. Since the mid-1990's, U.S. acreage in insect- corn and cotton, and herbicide-tolerant soybeans, has increased dramatically. By 1999, nearly 60 percent of soybean-harvested acres in the U.S. was planted to herbicide-tolerant soybeans, while nearly 40 percent of corn-harvested acreage and over 60 percent of cotton-harvested acreage was planted to biotech varieties.

Whether U.S. farmers will continue to expand their seeding of biotech crops this spring depends primarily on how they anticipate acceptance of biotech crops in domestic and foreign markets, which rests upon consumers' attitudes toward biotech food and feed products. At present, market demand for nonbiotech corn is very limited, accounting for only 1 percent of 1999 U.S. corn production. This demand stems primarily from 1) European Union (EU) imports, where products containing biotech ingredients must be labeled, 2) a few brewers in Japan that accept only nonbiotech corn as a grain ingredient, 3) domestic seed use, and 4) a handful of domestic food manufacturers that recently decided to use only nonbiotech ingredients.

According to analysis by USDA's Economic Research Service (ERS), market demand for nonbiotech soybeans now accounts for about 2 percent of U.S. soybean production and is associated mainly with 1) domestic seed use, 2) food soybeans exported to Japan (about 200,000 tons a year) under identity preservation (IP) marketing for making tofu, soy sauce, and other soy foods, and 3) a few niche markets in the EU. Most EU imports of soybeans and soybean meal (16 million tons of soybeans and 19

Pioneer Hi-Bred International, Inc.

million tons of soymeal) are used for animal feed, but a small share (less than 1 million tons) is used for food. Despite the relatively small market shares for nonbiotech corn and soybeans, demand for nonbiotech commodities is highly fluid and could expand quickly, depending on whether consumers' preferences for nonbiotech food products expand, as well as consumer preferences regarding the use of biotech crops in industrial uses and in livestock feed.

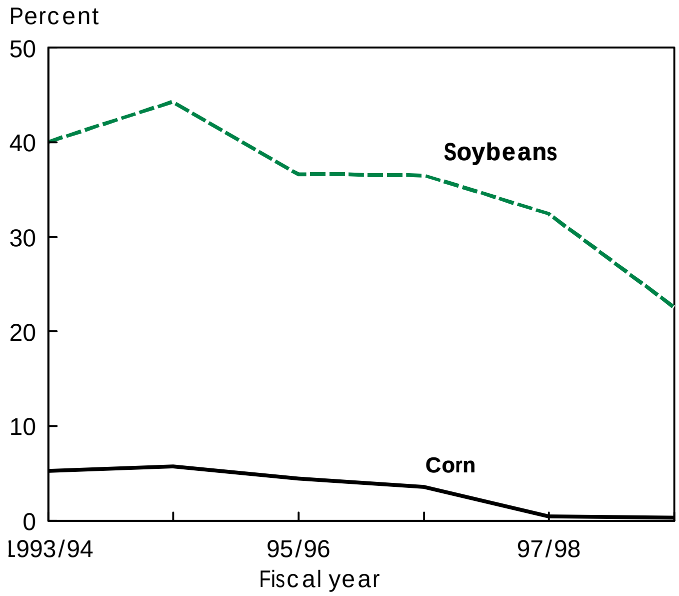
During the last 2 years, U.S. corn exports to the EU dropped about $200 million per year, on average, primarily because of declining exports to Spain and Portugal resulting from a moratorium on EU approval of new corn varieties already being grown in the U.S. The share of U.S. corn exports destined for the EU declined from 4.5 percent in fiscal year (FY) 1995/96 to less than 1 percent in FY1997/98 and FY1998/99. U.S. grain processing companies are concerned not only about corn exports, but more importantly, about exports of processed byproducts, such as corn gluten feed and meal. Export sales of U.S. corn byproducts have outpaced corn sales to the EU for a number of years. For example, the value of corn byproducts exported to the EU totaled $403 million in FY1998/99, far exceeding the $22-million export value for corn.

Some large U.S. grain processors—e.g., A.E. Staley and Archer Daniels Midland (ADM)—announced in April 1999 they would not accept EU-unapproved corn biotech varieties for processing for fear of jeopardizing their byproduct exports to the EU. Last summer, ADM advised producers to segregate biotech crops from nonbiotech crops, but reversed this decision in early February 2000 as weak demand for the higher priced nonbiotech grain became apparent.

Some countries have begun to require that foods containing biotech ingredients be labeled. The EU recently adopted labeling

Special Article

EU Share of U.S. Soybean Exports Dwarfs Corn Share



Economic Research Service, USDA

regulations for foods and is currently drafting feed labeling regulations. Japan, Korea, Australia, and New Zealand are among other countries proposing mandatory labeling policies for bioengineered foods. Potentially widening interest in food labeling regulation could be an impetus for more farmers and grain handlers to assess their ability to segregate or begin to take steps necessary to segregate.

Over the last year, a few food manufacturers decided to end the use of biotech crops in their operations. In July 1999, the Gerber and Heinz companies announced that their baby food processing facilities would immediately stop using biotech inputs. In January 2000, Bestfoods, Inc., decided to end its use of biotech ingredients in manufactured foods destined for the EU, in order to avoid the biotech labeling requirement, and Frito-Lay Inc. announced that it would cease using biotech corn in its snack food manufacturing.

Strategies to Separate Nonbiotech Grain

Current demand for nonbiotech corn and soybeans is weak, and according to grain trade sources, European consumers appear generally unwilling to pay premiums for bulk shipments of nonbiotech commodities. However, if circumstances were to change and demand for nonbiotech commodities were to strengthen, it would be necessary to form supply chains on a larger scale that keep the nonbiotech product separate from undifferentiated "standard" commodity grain. This could be accomplished by either "crop segregation" or "identity preservation (IP)." These marketing practices to preserve a commodity's unique characteristics are not new, but rather an extension of practices that have heretofore been used to preserve differentiation in markets for value-enhanced commodities such as high-oil corn and STS soybeans (nonbiotech, but herbicide-tolerant).

Identity preservation (IP) is the more stringent (and expensive) of the two methods and requires that strict separation—typically involving containerized shipping—be maintained at all times. IP is often used for marketing commodities like food-grade corn and soybeans. Testing for biotech vs. nonbiotech status typically occurs just prior to containerization. IP lessens the need for additional testing as control of the commodity changes hands, and it lowers liability and risk of biotech/nonbiotech commingling for growers and handlers.

Crop *segregation* requires that crops be kept separate to avoid commingling during loading and unloading, storage, and transportation. This supply chain system thus requires cleaning of equipment such as augers, as well as transportation and storage facilities. Such a handling process has been in place for some time for specialty grains (e.g., high-oil corn). But containerization is generally not involved, and testing to check for the presence of biotech content—which occurs at various points in the marketing system (e.g., country elevator, terminal elevator, and final purchaser)—is more critical.

Because of limited demand for nonbiotech corn and soybeans and the expense of maintaining separate storage facilities, few grain elevators have attempted to segregate and market nonbiotech products. Last September, Sparks Companies conducted a survey of 100 midwestern grain elevators and found that 11 percent were differentiating for nonbiotech corn and 8 percent for nonbiotech soybeans. Of the surveyed elevators, only 1 percent offered premiums for nonbiotech corn and 3 percent offered producer premiums for nonbiotech soybeans. The premiums varied widely, depending on the elevator's location and the intended consumer market for the product. According to other industry sources, common nonbiotech price premiums ranged from $0.05 to $0.10 per bushel for corn and $0.10 to $0.15 per bushel for soybeans. The lower end of the premium range reflects less strict tolerance levels (i.e., more biotech content) and vice versa. In February 2000, the Farm Progress Company's survey of 1,200 U.S. elevators indicated that 24 percent plan to segregate corn and 20 percent plan to segregate soybeans in the fall. Elevators are likely anticipating food labeling regulations in other countries.

Effective segregation or IP—which begins at the farm level—is particularly difficult if a farmer grows both biotech and nonbiotech varieties of a certain crop. Pollen drift is a natural occurrence over which farmers have little control but which can lead to the unintended presence of biotech material in nonbiotech crops. Using buffer zones may help minimize biotech commingling from pollen drift, but it remains a serious problem for effective crop segregation or IP. Pollen drift is a less critical issue for a self-pollinated plant like soybeans than for corn.

Not only must farmers keep biotech and nonbiotech plots separate, but they must also prevent commingling with biotech varieties during harvest, transport, and storage by cleaning all equipment and onfarm storage facilities. Testing methods are sensitive enough to detect very small amounts of biotech material, making it difficult to clean equipment thoroughly enough to meet a very strict standard. A recent straw poll of 400 U.S. farmers conducted by Reuters in January 2000 found that 15 percent of farmers have made or are planning to make the necessary investments to handle or segregate nonbiotech crops in the fall.

Elevators must also develop stricter control over handling procedures in order to maintain segregation. A key problem at the elevator stage is that segregation will likely slow the rate of turnover in a high-volume business. The elevator industry operates with very thin margins—differences between prices paid to sellers and prices received from purchasers—and elevator profits depend on moving large volumes of product quickly. Segregation slows the process because it involves tests to ensure that the grain is truly nonbiotech. In addition, farmers must form multiple queues (for biotech and nonbiotech) to deliver their grain, unless elevators specify days on which they accept only biotech or nonbiotech varieties. Particularly during peak harvest periods, delays can be a serious problem, and the need to segregate aggravates the problem.

Segregation also reduces the volume the elevator can maintain, because with commingling prohibited, some elevator bins will likely remain partially empty. This is referred to as "storing air" and may be a significant expense incurred by elevators when segregating different types of grain. In addition, elevators must clean all their equipment, including augers and bins, to make sure that no commingling occurs beyond the tolerance level. The tolerance level for biotech content in large part determines the degree of difficulty for grain handlers to maintain segregation of nonbiotech commodities—the stricter the tolerance level, the harder for grain handlers to comply.

The elevator's ability to segregate depends in large part on the size of the operation and the type of facilities at each location. There are currently no official estimates regarding the number of elevators that have the ability to segregate. However, the National Grain and Feed Association estimates that, at a 1-percent or lower tolerance level for biotech content, roughly 5 percent of the nation's elevators can achieve segregation without major new investments. At these elevators, two parallel-track supply chains generally already exist, one for handling standard bulk grains and the other for segregated grains.

Elevators that will be able to segregate most effectively have a large number of bins of varying capacity as well as multiple pits (where grain is dropped before being moved to a storage bin). Multiple pits enable the elevator to dedicate pits for either biotech or nonbiotech, reducing the likelihood of commingling. In addition, the size distribution of bins—e.g., a large number of small bins vs. a small number of large bins—affects the number of commodities an elevator is able to segregate. Elevators located on rivers may be able to segregate at lower cost and with less inadvertant commingling than inland terminals because they can often load grain directly onto vessels, with fewer unloadings and loadings.

WINDOW on the PAST

Excerpts from USDA publications

Demand Grows for Advances in Plant Breeding

Probably no question is of so much interest and importance to farmers . . . as the improvement of cultivated plants. . . . Experience . . . the world over has shown clearly that the possibilities in the improvement of our useful plants are almost unlimited. . . . The last half century has witnessed unprecedented extensions of the areas devoted to agriculture, and this has led to a demand, still imperfectly satisfied, for new sorts of cultivated plants adapted to the particular conditions of climate and soil in each new region.

Yearbook of Agriculture, 1897

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Elevators can use a variety of strategies to facilitate segregation. A grain handling firm may commit facilities at certain locations to handling only biotech or nonbiotech grains. Specializing in this way will prevent onsite commingling, ensure that elevator services are provided for nonbiotech crops, and may preclude the need for additional investments. Another strategy would be for a given elevator to accept nonbiotech and biotech crops on different days, enabling the elevator to regularly clean equipment and maintain crop segregation while minimizing elevator queues.

Segregation also poses logistical problems for grain transportation. Currently, grains and oilseeds are commonly transported to export elevators in unit trains of up to 100 cars or by barge. If effectively maintaining crop segregation makes it necessary to shift transportation away from unit trains toward smaller units (e.g., individual rail cars), transportation costs could increase significantly. According to the North American Grain Exporters Association, setting acceptable biotech content levels at about 5 percent or higher would increase costs only modestly. But if biotech-free thresholds were increasingly stringent, costs would rise. One industry source suggests that if the threshold for biotech content were as low as 1 percent (a threshold that would likely require IP), transportation costs could potentially double.

Nonbiotech Marketing Could Mirror Value-Enhanced Grain

The current system of agricultural marketing relies on broad, standardized quality grades to signal value (establish a price scale) through the market, and is based on commingling to achieve a particular quality. As consumers demand agricultural commodities with specific characteristics (such as nonbiotech), buyers and sellers will utilize alternative coordination strategies likely to resemble those for marketing value-enhanced products.

Special Article

Segregating Nonbiotech Crops: What Could It Cost?

Segregation of nonbiotech grains and oilseeds is essentially an extension of the handling process for specialty grains and oilseeds, which has been in place for some time. A University of Illinois study of segregation costs reported by 84 U.S. handlers of specialty grains and oilseeds in the spring of 1998 indicates that separation of specialty corn (high-oil corn or HOC) and specialty soybeans (Synchrony Treated Soybeans or STS—a herbicide-tolerant, but not biotech variety) adds, on average, $0.06 per bushel for HOC and $0.18 per bushel for STS soybeans (excluding purchasing premiums) above the customary costs of handling standard bulk commodities at each of those elevators. Segregation costs include the additional costs of storage, handling, risk management (for example, if quality is not as high as specified in the contract), analysis and testing, and marketing (expenses associated with negotiating contract terms). Minimum oil content specified in the contract generally ranges from 6 to 8 percent (7 percent, on average) for high oil corn. In contrast, quality for specialty soybeans is controlled by specifying in the contract that growers plant only the STS variety developed by DuPont.

In order to develop a scenario analysis, USDA's Economic Research Service (ERS) examined each of the cost items in the Illinois study at three points along the marketing chain—country elevator, subterminal, and export elevator—to determine adjustments or modifications needed to estimate approximate segregation costs for nonbiotech corn and soybeans. Although the costs of segregation vary significantly among the surveyed elevators, results indicate that, across all elevators surveyed, costs for segregating nonbiotech crops could be higher than for specialty crops.

Although the estimated costs are not small, they do not imply that disarray would occur in the grain marketing system if nonbiotech crops were handled on a larger scale. If nonbiotech crops remain a niche market, many elevators may choose to accept bulk grain and not attempt to distinguish between biotech and nonbiotech characteristics. This would be particularly true for those elevators handling the large portion of domestic corn and soybeans destined for feed use.

Not all elevators that choose to distinguish between biotech and nonbiotech would bear the costs identically. Some elevators currently handle niche market crops at relatively low cost, particularly if they are equipped with multiple pits and have bin space configured to facilitate segregation. In addition, specialization across elevators (some handling biotech, others nonbiotech) would also result in much lower added costs to the handling system. Further, adjustments in the grain marketing system would work to lower costs as economies of scale in handling are realized and new testing procedures are developed.

The ERS estimates, which should be taken as rough ballpark figures given the limited data currently available, indicate that, on average across the 84 surveyed elevators, segregation could add about $0.22/bushel (excluding premium to the producer) to marketing costs of nonbiotech corn from country elevator to export elevator. Segregation of nonbiotech soybeans at these elevators could add $0.54/bushel, on average, excluding the nonbiotech producer premium. These estimates reflect costs at these elevators and may not represent costs incurred by any one elevator or other elevators in general. In addition, it is important to note that these cost estimates do not take into account any additional costs that could be associated with segregation at the farm level and shipment expenses beyond export elevators to foreign markets.

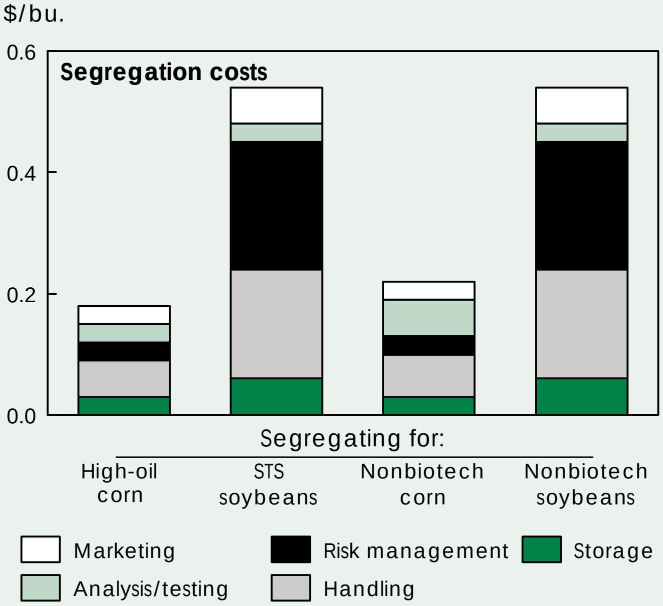
These cost estimates reflect a scenario analysis under the following assumptions: 1) risk management cost is not greater for nonbiotech corn than for HOC (i.e., assuming a high tolerance level for biotech content); 2) two-tier segregation is needed to safeguard against commingling (some elevators have already adopted this practice); and 3) a multiple trait ELISA test kit will be introduced to detect biotech content for Roundup Ready and Liberty Link corn varieties.

In developing this scenario, ERS makes two important adjustments to the Illinois cost estimates. First, the cost estimate for corn at the country elevator is adjusted to reflect a two-tier segregation requirement—to segregate biotech from nonbiotech varieties, and to separate biotech varieties into those approved for shipment to the European Union from EU-unapproved varieties, because most country elevators lack complete knowledge about the destination of corn shipments. For shipments to domestic markets, two-tier segregation might be necessary because some processors (such as Archer Daniels Midland and A.E. Staley) accept only EU-approved corn varieties. Similarly, for shipments to the EU, no commingling with EU-unapproved varieties is permitted. To the extent that producers channel their corn to market outlets that accept EU-unapproved varieties (such as domestic feedlots), handling costs at local elevators could be lower.

Adjusting for two-tier segregation is estimated to increase handling costs for nonbiotech corn at *country elevators* to $0.03/bushel—higher than the $0.02/bushel reported in the Illinois study. Biotech segregation imposed no additional handling cost above the $0.02/bushel incurred at *subterminals* and *export elevators* for segregating specialty corn, because operators know the destination of grain shipments at those facilities. No adjustment was necessary to the cost estimate of handling soybeans, at $0.06/bushel, since biotech soybeans commercially grown in the U.S. are EU-approved.

The adjustment for testing costs reflects the higher cost of testing for biotech content, which is more complicated than testing for physical characteristics such as oil content for high-oil corn. Grains handlers commonly use two testing methods—the DNA-based PCR (polymerase chain reaction) and the protein-based ELISA (enzyme-linked immunosorbent assay). PCR takes 2-10 days at a cost of $200-$450 per test—higher than most country elevators can afford because of the small volume per truck load. In contrast, an on-site ELISA microwell test takes 2 hours and costs up to $10 per

Segregation Adds to Grain Handlers' Costs



Estimated costs of segregation along the marketing chain from country elevator through subterminal and export elevator, for value-enhanced commodities—high-oil corn and STS (herbicide-tolerant) soybeans—and for nonbiotech corn and soybeans. Nonbiotech corn and soybeans contain no (or minimal amounts of) genetically modified material.

Economic Research Service, USDA

test. A faster and simpler ELISA dipstick test to provide a "yes-no" result takes 5-10 minutes and costs just $3.50 per test. At a 99-percent purity level, a typical ELISA test uses a sample of 50-60 kernels out of close to 1,000 bushels in a truck load. A smaller sample size (40-50 kernels) would be used for testing at a 95-percent purity level.

The additional cost of testing for biotech content using ELISA test kits is estimated at $0.01/bushel for one specific new trait (e.g., Bt corn) at *country elevators*. However, since current ELISA testing methods require a separate test for detection of each unique trait, several tests may be required to determine if a truck load of corn is free of biotech material. The ERS analysis assumes four separate ELISA tests for five biotech corn varieties at country elevators—3 Bt varieties, plus Liberty Link and Roundup Ready. While biotech content in the 3 Bt varieties can be detected technically in one test, multiple tests (usually two) are a common practice adopted by local elevators. This increases the cost of analysis and testing for nonbiotech corn to $0.04/bushel from the $0.01/bushel reported in the Illinois study.

At *subterminals* and *export elevators*, PCR testing is more common than ELISA because it is very sensitive and can be used to detect the presence of several gene modifications in one set of tests. However, PCR tests are generally conducted in commercial labs. In addition, it becomes more economical with the larger volume of grains being handled, remaining just $0.01/bushel as estimated by the Illinois study. The cost of testing soybeans is the same as for corn, at $0.01/bushel.

A typical sample size for testing is about 80 pounds of grain in a river subterminal, which handles about 50,000-55,000 bushels of grain in a barge.

Risk management costs for segregating grain into biotech and nonbiotech conceivably could be greater than for handling high-oil corn or STS soybeans, because producers face significantly different risks. For example, a 1-percent lower oil content might reduce price premiums paid to HOC producers. However, 1-percent biotech content in a grain shipment could cause rejection, which has much more serious consequences for grain exporters. Because there is no way to quantify this extra cost, ERS assumes the risk management cost is the same as for HOC in the Illinois study, $0.01 per bushel or $0.03 from country elevator to export elevator.

No adjustment was necessary to **marketing costs**—$0.03 per bushel for corn and $0.06 per bushel for soybeans—or to **storage costs**—$0.03 per bushel for corn and $0.06 per bushel for soybeans—as these costs are the same for value-enhanced and nonbiotech commodities across the three elevator points.

In considering segregation costs from production through marketing, ERS excludes purchasing premiums to producers because the gain to producers offsets the loss to the country elevator. However, the common range for purchasing premiums currently offered by a few elevators is $0.05 to $0.10 per bushel for nonbiotech corn and $0.10 to $0.15 per bushel for nonbiotech soybeans, according to industry sources.

Some U.S. grain handlers are already segregating grain for certain export markets. For example, Cargill is segregating nonbiotech corn for Japan, although without guaranteeing a specific tolerance level for biotech material. Patterning corn segregation after handling procedures for HOC can usually meet the nonbiotech requirements of Japanese buyers. To avoid commingling in shipments, grain handlers may also contract with producers to plant only certain corn varieties (e.g., nonbiotech or EU-approved) and require adoption of specific production and harvesting practices.

These cost estimates are meant to indicate general magnitudes and are likely to change as adjustments occur in the marketing system for specialized commodities. For example, segregation costs could be lower if the volume of segregated commodities expands and the grain handling industry realizes economies of size. Handling costs at country elevators could be lower if EU-unapproved corn varieties were channeled by producers only to market outlets that accept them. Development of more cost-effective test kits could also decrease costs. Actual expenses associated with risk management, such as liability and risk of commingling for growers and handlers of nonbiotech commodities, could be different from those for specialty grains. Finally, segregation costs for nonbiotech soybeans could be considerably lower (perhaps dropping from the estimated $0.54/bushel to $0.18/bushel, on average) if handling is patterned after the less stringent HOC procedures instead of STS soybeans.

Special Article

The most successful value-enhanced grain crop to date is Optimum high-oil corn (HOC), developed by Dupont using traditional breeding methods (as opposed to biotechnology) and released in the U.S. in 1992. In 1999, U.S. farmers planted about 1 million acres to HOC. Feed from high-oil corn—with an oil content of 6-8 percent compared with less than 4 percent for commodity corn—provides a significantly higher level of energy than standard corn. The added value from this crop comes from reduced expenditures for fat supplements in the feed ration, improved digestibility, and improved feed efficiency. Since 1998, about 50 percent of the high-oil-corn supply was grown by farmers who fed it directly to their own livestock. The remainder was exported to nations where fat additives are in short supply (for example, Mexico, Japan, and Taiwan).

High-oil corn—along with a wide variety of other value-enhanced feed grains and oilseeds—is marketed through a business of Dupont, Optimum Quality Grain (OQG), which licenses this technology to more than 80 seed dealers. Given that the value of this product differs between domestic and export markets, OQG has developed a two-tiered marketing approach to capture the crop's value.

Domestic farmers who grow HOC to feed their own livestock purchase the seed (generally at a premium) from licensed technology providers. For HOC exports, OQG contracts with growers and pays a premium for the HOC crop. These contracts involve few management restrictions, but do require the grower to purchase the seed from a licensed dealer who usually charges the grower a technology fee. For the 2000 corn contract, OQG is offering a $0.15-per-bushel premium for HOC at the 7-percent level, and higher as oil content increases. The crop is examined using near-infrared transmittance technology at all elevator transfer points to determine the oil content of the commodity.

The logistics of the export marketing system are managed by OQG and strategic partners—ADM, ConAgra, and Consolidated Grain and Barge. A farmer seeking a contract to grow HOC (or any other value-enhanced variety that OQG deals in) can identify interested local elevators through the internet. Optimum Quality Grain ensures that high-oil corn is segregated throughout the supply chain through a network of contracts that coordinates movement of the crop—from farm to elevator to barge to ocean freight to consumers who pay a premium for the product.

Other strategies are used to market products with selected characteristics. For example, Japanese consumers have very strict and specific quality requirements for food-grade soybeans. Japanese firms hire brokers who contract with U.S. farmers to produce exactly the type of soybean they require and pay premiums for those characteristics. Specific tolerance levels are indicated in the sales contract, as is often a provision for quality testing. However, testing methods currently available in the marketplace may not be totally reliable for detecting biotech material.

The market for nonbiotech commodities is not yet well understood. Lack of information about the magnitude of premiums that consumers may be willing to pay for nonbiotech crops make near-term decisions difficult for elevators and farmers.

April Releases—USDA's Agricultural Statistics Board

The following reports are issued electronically at 3 p.m. (ET) unless otherwise indicated.

April

3	*Dairy Products*
	Crop Progress (4 pm)
4	*Weather - Crop Summary*
	Pest Management Practices
5	*Broiler Hatchery*
	Egg Products
	Poultry Slaughter
7	*Dairy Products Prices (8:30 am)*
	Vegetables
10	*Crop Progress (4 pm)*
11	*Crop Production (8:30 am)*
	Weather - Crop Summary
12	*Broiler Hatchery*
13	*Potato Stocks*
	Turkey Hatchery
14	*Dairy Products Prices (8:30 am)*
	Cattle on Feed
17	*Milk Production*
	Crop Progress (4 pm)
18	*Weather - Crop Summary*
	Hatchery Production - Ann.
19	*Broiler Hatchery*
20	*Catfish Processing*
	Cold Storage
	Dairy Products Prices
	Livestock Slaughter
24	*Chickens & Eggs*
	Crop Progress (4 pm)
	NASS Facts Newsletter (4 pm)
25	*Weather - Crop Summary*
	Dairy Products - Ann.
	Floriculture Crops
	Milk - PDI
26	*Ag Chemical Usage - Livestock*
	Broiler Hatchery
27	*Meat Animals - PDI*
28	*Dairy Products Prices (8:30 am)*
	Agricultural Prices
	Peanut Stocks & Processing
	Poultry - Prod. & Value

Compounding the difficulty is uncertainty about the effectiveness of product quality monitoring and about tests to accurately determine whether a crop meets yet-to-be-determined tolerance standards for biotech content. These problems suggest that nonbiotech crops will be marketed in ways that differ from standard commodities, and that at least in the near term they will be sold as niche market products using many of the same marketing techniques currently used for value-enhanced products. **AO**

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