detection and identity preservation certification in the United States," says Navarro. To test the very DNA of crops, GeneScan's laboratories use a method called polymerase chain reaction (PCR). "That's our chief technology for detection. It's an extremely reliable DNA test. It detects the actual modifications themselves in plant DNA."

Because this DNA test can take three to five days to get results, quicker tests are also conducted in the field, including a test for the protein present in GM crops. While these tests are not as exact as a DNA test, they give results in about 10 minutes. "It may not be as robust as PCR, but it's just as necessary," says Navarro.

Along with testing at every step of the process, GeneScan also helps companies implement good growing, shipping and processing practices. "You've always got to complement testing with good practice to preserve the integrity of the product," says Navarro. "It all really boils down to risk-management. Not only are we able to give them the tools to test it, we also give advice and guidance on how to control these parameters within their operation."

Risk management is important; although farmers start by planting non-GMO seed, it is possible for contamination to occur at any time, especially in corn and soybeans, because so much of what is planted elsewhere is genetically modified.

"Take corn, for example," says Navarro. "Cross-pollination, from insects or wind, can greatly affect gene flow across crops." Along with testing, he helps growers find ways to avoid this problem. "Non-GM growers implement programs such as buffer rows," he says. These additional rows of crops are not harvested as non-GMO, but serve to absorb any drift from nearby fields. "Good agronomic practices like these will help you."

Accountability continues long after the crops are harvested. "Everybody needs to take ownership in their part of the process," says Navarro. "In transport, that means having clean bins on barges and trucks."

Jim Skiff, president of US Soy, Mattoon, Illinois, knows first-hand the importance of accountability, especially in Japan's growing market for non-GMO soybeans. "Our Japanese customers are very insistent on having a paper trail," says Skiff. "We only grow our own varieties and try to keep this a closed-loop operation. We pay our growers a premium to grow our variety and to deliver it back to us."

"We have several controls and test points," according to Kate Leavitt, director of international sales and marketing for Sun-Rich/Sunopta Grains and Foods Group, Minnetonka, Minnesota. "And our standard operating procedures continue to evolve with technology."

The Difference In Cost

Because they are not genetically engineered to fight disease, weeds or pests, non-GMO crops are inherently more expensive. The premiums paid to growers for non-GMO crops can also add some expense.

Add to that the cost of testing, which may vary according to needs for labeling. "We have a lot of follow-up testing," says Skiff of his soybean crops. "We test the fields, and we test the beans when they're harvested. That's an additional expense, and that adds to a difference in cost between GM and non-GM." Despite this, says Skiff, "It's going to be less than a 10 percent cost difference."

Others find the number harder to pinpoint. "It's really all over the board," says Sunrich's Leavitt. "The non-GMO premium is only part of it."

"There is a higher cost associated with