Food Quality
Farm to Fork Quality Assurance

Raw Materials

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Identity That Goes with the Grain

Systems that track certain varieties start with certified seed and end with traceable, high-quality ingredients | BY **BERNARD TOBIN**

Characteristics that make food products distinct can often be traced to the ingredients used in processing. When it comes to baked goods such as breads and pastries, product differentiation often starts with a specific variety of wheat that provides unique baking characteristics.

Different varieties of grain may contain specific quality attributes desired by processors. For example, each variety of malting barley used for beer making produces beers with distinct flavors, colors, and quality characteristics.

Some food and beverage processors are looking for varietal consistency in grain products, because their customers expect to purchase a product that looks and tastes the same every time. Bakeries may request that only certain varieties of wheat be used in their bread products so they can better predict dough strength and the settings required for mixing, fermentation, and proofing processes, producing bread that is more consistent in volume, texture, and color.

To ensure the availability of these characteristics in the baking process, many processors contract with grain companies to deliver identity-preserved (IP) grain. IP involves a series of process steps designed to keep grain with special quality traits separate from other varieties and crop types. In grain handling, this means that a grain company keeps IP grain separate from the bulk supply chain.

If a specific variety is requested, certified seed is required. "Certified seed is the foundation of the IP process," explained Dale Adolphe, executive director of the Canadian Seed Growers' Association.

"When farmers start with certified seed, they produce grain that has minimal contamination from unwanted seeds—other grains, weeds, diseased kernels—and more consistent functional and nutritional characteristics. For processors, it's a key building block for the quality assurance, product differentiation, and traceability they're seeking," he said.

The IP process is then implemented and followed to ensure that the quality characteristics of certified seed are protected throughout production.

IP works to maintain quality traits in two ways: It ensures that grain with the specific traits desired by a customer is kept separate from other types and varieties of grains and that the product is traceable, from the certified seed used to grow the crop and the field preparation records right up to the raw grain product shipped to the customer by a grain handling company. Records are kept at every step of the process, and lot identification numbers are used to trace grain from the grain-handling company back to the farm. These records and lot identifiers provide customers evidence of the due diligence taken in the handling, storage, and shipment of IP grain.

In Canada, an estimated 5% of wheat, 33% of soybeans, and 11% to 15% of canola is managed using IP protocols. All malt barley is IP because of the specific quality requirements imposed by brewers and distillers. The Canadian Grain Commission certifies the quality management processes that many grain companies use to ensure quality control and traceability under its Canadian Identity Preserved Recognition System program.

Melonie Stoughton-Ens is the Commission's HACCP technical adviser. She explained that the CGC certifies IP quality management systems against its Food Safety Identity Preserved Quality Management System Standard. Before becoming certified, a grain company must develop a quality management system based on the requirements laid out in the FSIP Standard. These requirements include documentation and record-keeping

procedures, employee training, internal auditing, corrective action procedures, and product traceability.

Once the company's IP QMS has been developed, it is audited by a CGC-trained and accredited third party auditor. If CGC requirements are met, the company's QMS becomes certified under CIPRS. This three-year certification is subject to surveillance audits on an annual basis for the duration of the certification. The certification is voluntary, and grain-handling companies become certified if they believe it will provide a competitive advantage in marketing grain.

"In a CIPRS-certified system, grain handling companies coordinate activities and contract with farmers to provide IP grain," said Stoughton-Ens. "The grain company is audited on their procedures, documentation, and record keeping for IP product within their own facility and their contracted farmers. CIPRS certifies that IP grain has been handled in accordance to a CGC-certified IP-QMS system; it does not certify grain for varietal purity."

On the Farm

The IP process starts on the farm before the grain is seeded. Grain companies contract with farmers before the crop is sown and crop production requirements are established. Grain companies, in turn, must ensure that the farmers they deal with engage in responsible farm management practices that respect IP requirements.

"The farmer must keep crop history records to minimize the risk of varietal cross contamination from volunteer crops," noted Stoughton-Ens. "Isolation distances must also be kept between the IP crop and similar types of crops to prevent cross contamination due to pollen drift."

Isolation distances vary depending on the crop and customer specifications. Farmers must also ensure that seeding equipment is cleaned prior to planting IP grain. After seeding, farmers must monitor their fields for volunteer crops, weeds, and other potential contaminants—and perform good agronomic practices to minimize cross contamination.

Before IP grain is harvested, farmers must clean all harvest equipment, including combines and grain truck boxes. Bins used to store IP grain on the farm must also be cleaned and inspected to prevent cross contamination. Farmers must keep records showing when the grain was harvested, when the harvest and storage equipment was cleaned, and where the IP grain was binned.

The farmer will assign a unique lot identification number to each lot of IP grain, and this number will be associated with all on-farm IP records. Even the vehicle used to transport the grain from the farm to the grain handling facility must be inspected and cleaned, whether it is the farmer's own vehicle or a commercial transport vehicle.

At the Elevator

IP grain deliveries to elevators are verified upon delivery by the grain company using the farmer's documentation and records. Depending on contract requirements, the grain delivery may also be tested for varietal purity. A sample of the IP grain lot is taken at delivery and given a lot identifier number that is linked to the elevator's processing records as well as the farmer's on-farm records. This unique lot number will appear on all grain handling and processing records associated with that particular lot of IP grain.

In order to prevent cross contamination, all elevator grain handling equipment, such as receiving pits, conveyors, and storage bins, must be inspected and cleaned prior to handling the IP grain. Conveyance containers used for transporting IP grain to the customer must also be cleaned and inspected. The unique lot identification number accompanies shipping documents and allows for the traceability of IP grain from the shipping container back to the farm where it was grown.

All of the procedures and paperwork involved serve a purpose, said Stoughton-Ens: "The whole system of inspection, cleaning, documentation, and record keeping provides evidence to the customer of the due diligence taken by the company to ensure that the grain maintains the desired quality traits." ■

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