Raising the Bar on Soybeans with SQT

A joint USB-AOCS quality traits program for soybeans

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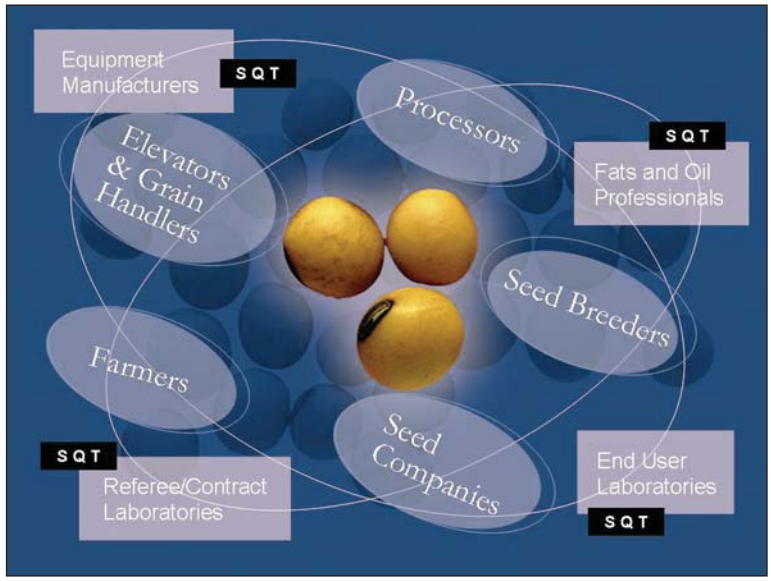

The United Soybean Board (USB) and the American Oil Chemists' Society (AOCS) are in partnership to bring analytical excellence to soybean analysis. A current project, part of USB's domestic marketing and production programs, is part of a long-standing relationship between the two organizations.

One of USB's goals is to improve the market for soybeans grown in the United States. In response to the ever-changing needs of the soybean oil and meal end users, USB launched the Better Bean

Initiative (BBI) to accelerate the development and availability of soybean varieties with enhanced compositional traits.

Oil and meal users identified a number of quality traits for early improvement. Soybean oil low in saturated fat and linolenic acid but with an increased level of oleic acid is desirable for consumer health, oil stability, and for food labeling issues. Increasing the levels and digestibility of certain amino acids in soybean meal and decreasing the levels of nitrogen and phosphorus excreted in manure by poultry and livestock will have nutritional and environmental impacts. Although it is envisioned that a new commodity bean will emerge, its introduction will be regional and so it is vitally important to reliably detect the presence of an enhanced trait at all stages in the continuum, from breeder to consumer.

In response to another goal of the BBI, the USB awarded AOCS a multiyear contract to develop a program to ensure the reliability of the analysis of quality traits in the soybean industry. This community is a continuum of suppliers and customers, from the seed breeder through the supplier, farmer, and elevator operator to the processor and food/feed producer. To provide confidence in the presence of an enhanced trait, it should be demonstrable with a high level of precision. This can only be achieved if there is a system in place to certify the analytical measurement. A number of requirements have been identified for the implementation of an analytical quality scheme. It can be divided into a number of activities which, when completed, will provide the infrastructure for the provision of reliable analytical results at all levels of the soybean industry. This relationship is demonstrated in the accompanying figure.

The following phases were proposed for the USB/AOCS Soybean Quality Traits Analytical Standards Program (SQT).

1. Method identification for protein and oil content and fatty acid composition analysis.

   This phase is completed for oil, protein, and fatty acid composition following meetings in Minneapolis and Montreal at the AOCS annual meetings in 2001 and 2002, respectively.
2. Development and validation of methods of analysis including the evaluation of secondary methods.

   A committee was formed in the summer of 2002 to address the use of NIR technology and the development of a universal calibration using a common set of reference samples.
3. Identification of users and their requirements (seed companies, referee and private laboratories, end-user laboratories, elevator and crop handling facilities). After discussions with representatives from these stakeholder groups a core group of experts met in July 2002 for the inauguration of the program.
4. Development of Soybean Quality Traits Laboratory Program, including use of proficiency testing and standards.

   This program currently tests reliable measurements for content of moisture, oil, and crude protein, as well as for fatty acid composition. As soybeans with new quality traits emerge, additional tests will be included in the testing scheme. A grow-

ing number of laboratories participating in soybean analysis throughout the continuum have been identified and invited to join the proficiency program. A web-based program was launched in February 2003 (netlink: www.SoybeanQualityTraits.org).

Future phases of development are (5) the implementation of laboratory quality assurance and (6) the requirement for inclusion of methods of analysis in ISO 17025 certification-quality audits.

As outlined above, significant progress has been made in the establishment of a program to address the quality and reliability of analytical measurement throughout the soybean continuum from seed developers to food processors and consumers, and to support the development, marketing and post-harvest processing of soybeans with enhanced traits. The program addresses and advocates analytical methodology having the backing of AOCS and other standards development organizations. SQT will recognize laboratories in the method development arena by identifying and supporting the development of robust easy-to-use secondary technology. The use of samples from a soybean library and their incorporation into the calibrations of each manufacturer will drive consensus and increase the validity of results throughout the continuum.

Enrolling in the program is free, courtesy of USB support. If your facility would like to enroll, you can contact AOCS Technical Services at 217-359-2344 or e-mail sqt@aocs.org; or you can enroll online at www.SoybeanQualityTraits.org. Some of the other companies/organizations already enrolled include Cargill, CHS, Monsanto, Pioneer Hi-bred, Iowa State University, the Universities of Illinois, Minnesota, and Tennessee, and the U.S. Department of Agriculture and Grain Inspection, Packers, and Stockyards Administration.

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