



Task Force

1996 Indiana Soybean Composition Data

*Dirk E. Maier, Agricultural & Biological Engineering
Jenni L. Briggs, Agricultural & Biological Engineering
Ralph W. Gann, Indiana Agricultural Statistics Service*

Value added grains and oilseeds (or, Specialty Grains, Identity Preserved Grains, High Value Crops, Super Commodities) have specific traits that have been genetically developed for specific end use purposes, such as for corn dry and wet milling, snack food manufacturing, and peroxidase recovery from soybean hulls. Examples include food grade white and yellow corn, waxy corn, high oil corn, and high peroxidase soybeans. High value end use products include starch, sweeteners, oil, snack foods, seed, gluten feed, tofu, and high protein animal feeds.

Grain quality properties can be defined in terms of physical, sanitary and intrinsic quality characteristics (see Grain Quality Fact Sheet GQ-23). Maximizing intrinsic quality factors, such as protein, oil, and starch content, can increase product value by 10 - 40 cents per bushel, or more. The markets for grains and oilseeds are beginning to recognize the potential of these factors with respect to product differentiation and new marketing opportunities. Intrinsic quality factors are becoming more important than the standard grade factors for marketing.

This fact sheet summarizes the first year of composition data compiled for soybean samples collected in Indiana during the 1996 harvest (see Grain Quality Fact Sheet GQ-24 for 1995 corn data).

Composition Analysis

Intrinsic characteristics (or, Chemical Properties, Traits, Composition Factors), such as starch, protein, and oil, can be quantified in whole kernels of corn and soybeans using state-of-the-art Near Infrared Transmittance (NIT)

scanners. Producers, handlers, processors and plant breeders need access to this rapid-analysis tool to quantify these intrinsic factors precisely in order to develop and expand value-added marketing opportunities. Unfortunately, only a few of these machines are currently available and are being utilized. Additionally, only Iowa has had a long-term effort in place for developing a public database of composition values for both corn and soybeans grown in that state.

Testing for composition of corn and soybeans should be of interest and importance to:

- (1) Crop producers interested in taking advantage of premiums for quality grain.
- (2) Livestock feeders aiming at optimizing ration formulation, and utilizing higher protein and oil grains for feeds.
- (3) Elevators merchandising grain based on desired quality parameters.
- (4) Processors in need of grain qualities that optimize milling and end product yield.
- (5) Exporters competing in foreign markets.
- (6) Plant breeders striving to develop specialty corn and soybean varieties.

Methodology

Soybean samples were taken directly from the field as part of the annual yield survey conducted by the Indiana Agricultural Statistics Service. A total of 36 samples were analyzed for composition using a NIT scanner available at the Purdue University Grain Quality Laboratory in the Department of Agricultural and Biological

Engineering. Samples from 8 districts were obtained. The NE district was not represented. All results are reported based on 13% moisture (wet basis).

Results

The 1995 American Soybean Association soybean quality survey data indicate Indiana soybean protein and oil content as 36.20% and 18.14%, respectively. Our 1996 data show that protein content is slightly higher than in 1995 and oil content dropped (Table 1). In upcoming years, as our database begins to grow, a comprehensive comparison between Indiana districts will be possible. Currently, it is not possible to draw statistical inferences based on the number of samples available thus far. In addition to these samples, another 110 soybean samples have been analyzed in our Grain Quality Lab since October 1996. The composition values for all Indiana soybean samples analyzed are 35.5% protein and 18.4% oil. Protein content decreased and oil content increased compared to the Indiana Agricultural Statistics samples.

The results give an indication of the composition values of soybeans across Indiana. Conditions during the growing season, hybrid selection, and soil fertility significantly affect intrinsic values. Producers need to have their own samples analyzed for precise values. Purdue University's Grain Composition Analysis Service offers NIR analysis on whole corn and soybeans (Call 317-494-2285 for further information). Hence, this database will expand in future years to include additional samples from variety trials across the state.

Grain Quality Fact Sheets can be accessed on-line through:

World Wide Web:

<http://hermes.ecn.purdue.edu:8001/server/purdue/acspub.html> (select) Grain Quality

or <http://pasture.ecn.purdue.edu/~grainlab> (select) On-Line Extension Publications (select) Grain Quality Fact Sheets

Almanac:

send e-mail to: almanac@ecn.purdue.edu
message:

send grain guide

or send grain catalog

or send grain factsheet#12 (for example)

or send acsonline GQ-12

Table 1. Summary of the 1996 Indiana Soybean Composition Survey (13% Moisture Basis)

District	Number of Samples	% Protein		% Oil		% Fiber	
		Ave.	Range	Ave.	Range	Ave.	Range
NW	7	36.8	35.6-39.4	16.7	15.5-17.3	5.7	5.5-5.9
NC	7	37.5	36.2-38.8	17.2	16.3-18.0	5.5	5.3-5.7
WC	1	34.4	n/a	17.7	n/a	5.7	n/a
C	11	36.7	34.4-42.9	17.2	16.2-18.5	5.7	5.4-5.9
EC	2	34.5	31.3-37.6	17.2	17.1-17.2	5.7	5.4-5.9
SW	6	36.2	34.4-37.8	18.4	17.0-19.8	5.6	5.4-6.0
SC	1	37.9	n/a	19.1	n/a	5.4	n/a
SE	1	36.7	n/a	17.1	n/a	5.4	n/a
All	36	36.6	31.3-42.9	17.3	15.5-19.8	5.6	5.3-6.2