

BACKGROUND

- ❖ The value of the soybean crop is the protein and oil content of its seeds. Many factors influence protein and oil content of soybean but the factor farmers can control best is the variety to grow. There is a growing trend to test soybean for oil and protein at the first point of sell even if grain elevators often don't test each load of soybean at delivery.
- ❖ Certain export markets have minimum cutoff values of 35% protein content and 19% oil content.
- ❖ Knowing the protein and oil content help farmers to estimate total processed value (ESP). ESP is the total value of products originating from a bushel of raw soybeans on the basis of protein and oil content mainly influenced by the market prices for soybean meal, crude soybean oil, and mill run.
- ❖ Based on target ESP, farmers can select hybrids or change management options to improve the values of their soybean.
- ❖ The University of Nebraska-Lincoln and the Nebraska Soybean Board cooperated in this educational program where farmers sent samples at harvest in return for learning the protein and oil content of soybean produced on their farm. The information can be used for selecting hybrids to grow the next season.

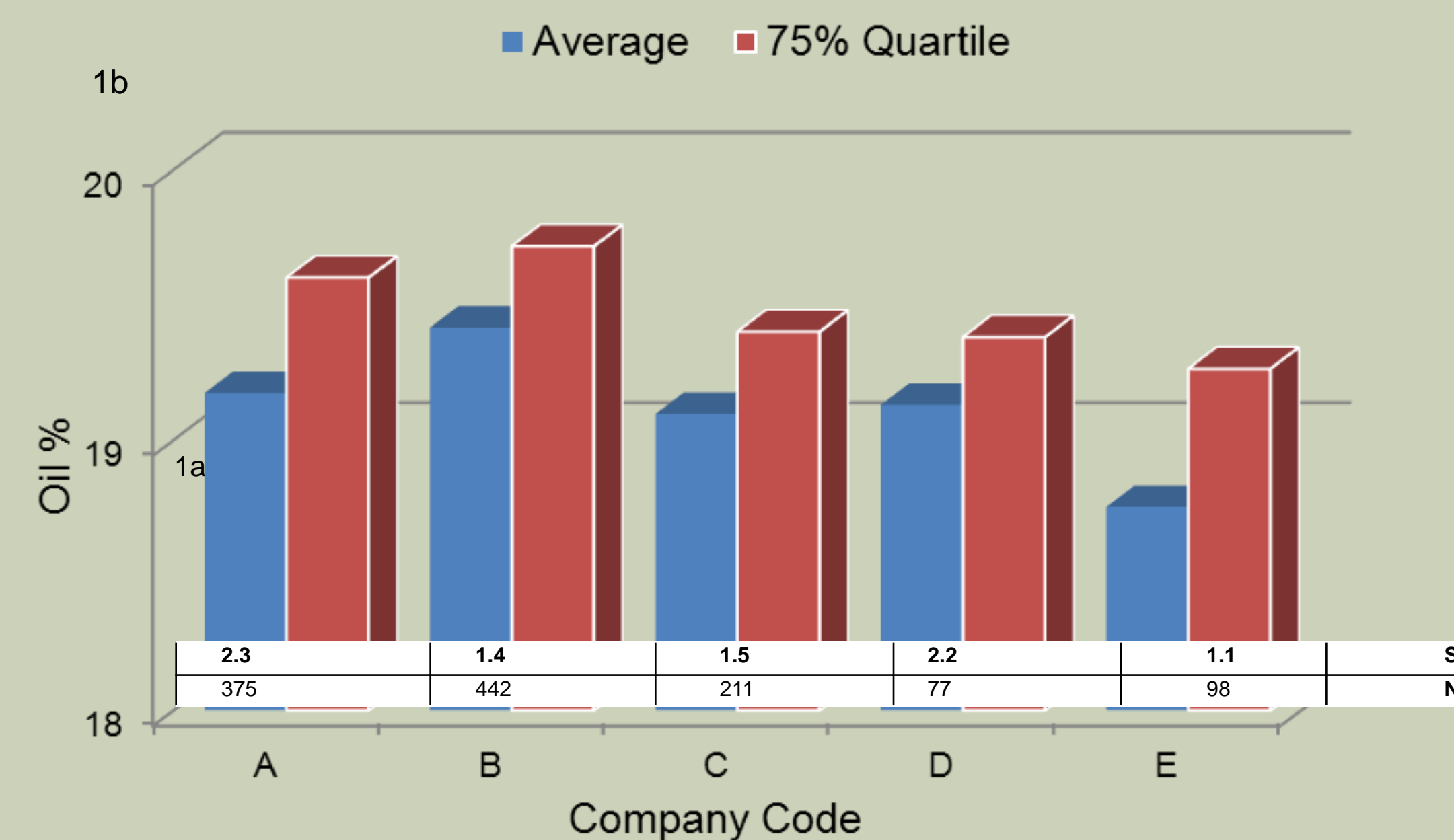
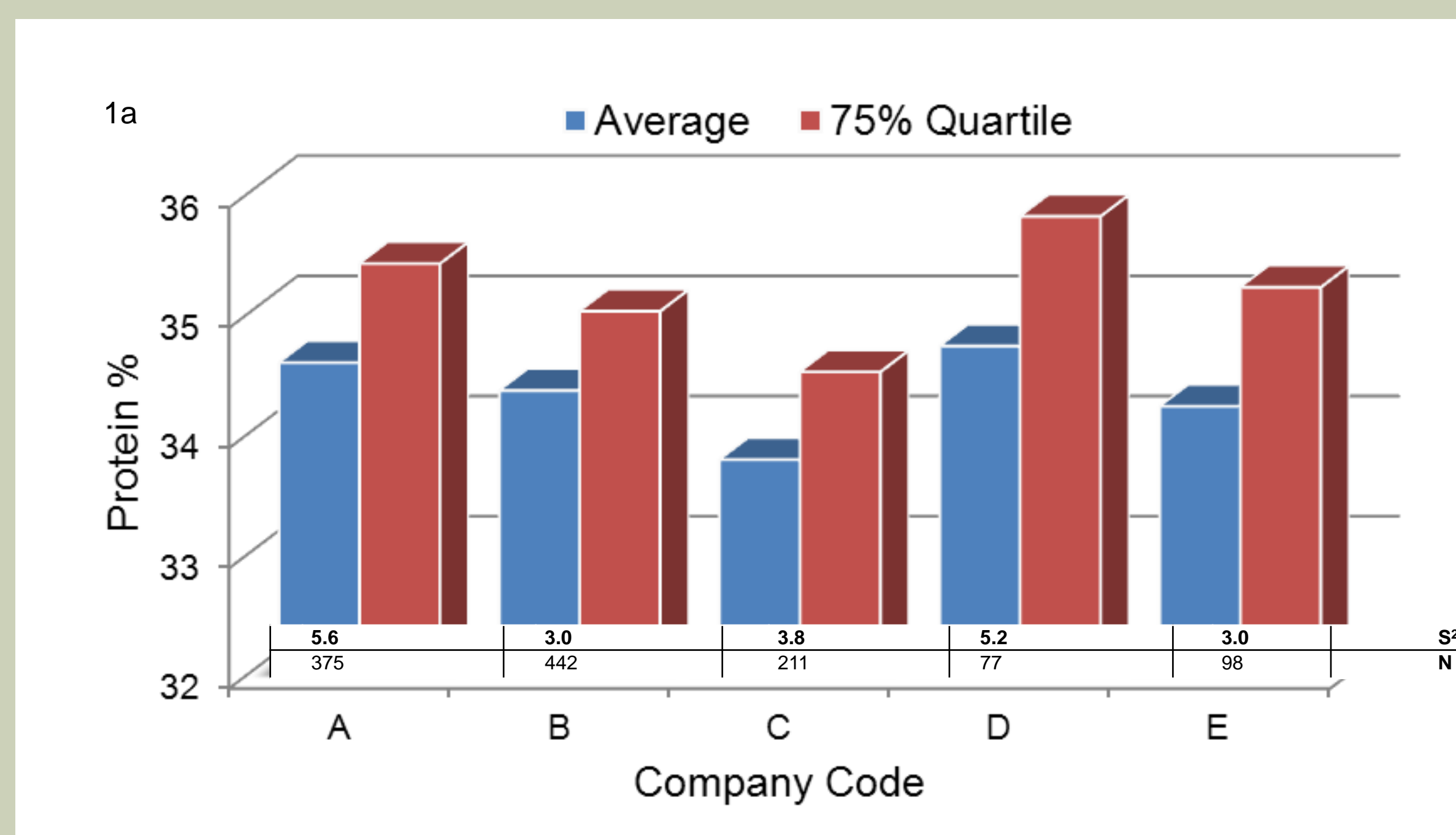
Material and Methods

- ❖ Farmers received sample bags holding about a pound of soybean seeds through direct mail, local high school FFA or during soybean field days across the state.
- ❖ Sampling instructions were included on the sample bags and space to write the name of the hybrid, the brand or company name holding the hybrid.
- ❖ Upon receipt, the samples were analyzed using NRI machine and results sent to the address provided on the bags.
- ❖ The information summarized in here contained analysis form more than 1200 hybrids belonging to the major seed companies operating in the state and the brand names associated with these companies.
- ❖ Data with missing company or brand name, variety name, or missing proper address were not included in the analysis.
- ❖ Data was analysis using SAS.
- ❖ In order to avoid possible proprietary right issues, company and brand names are coded in this presentation.

RESULTS

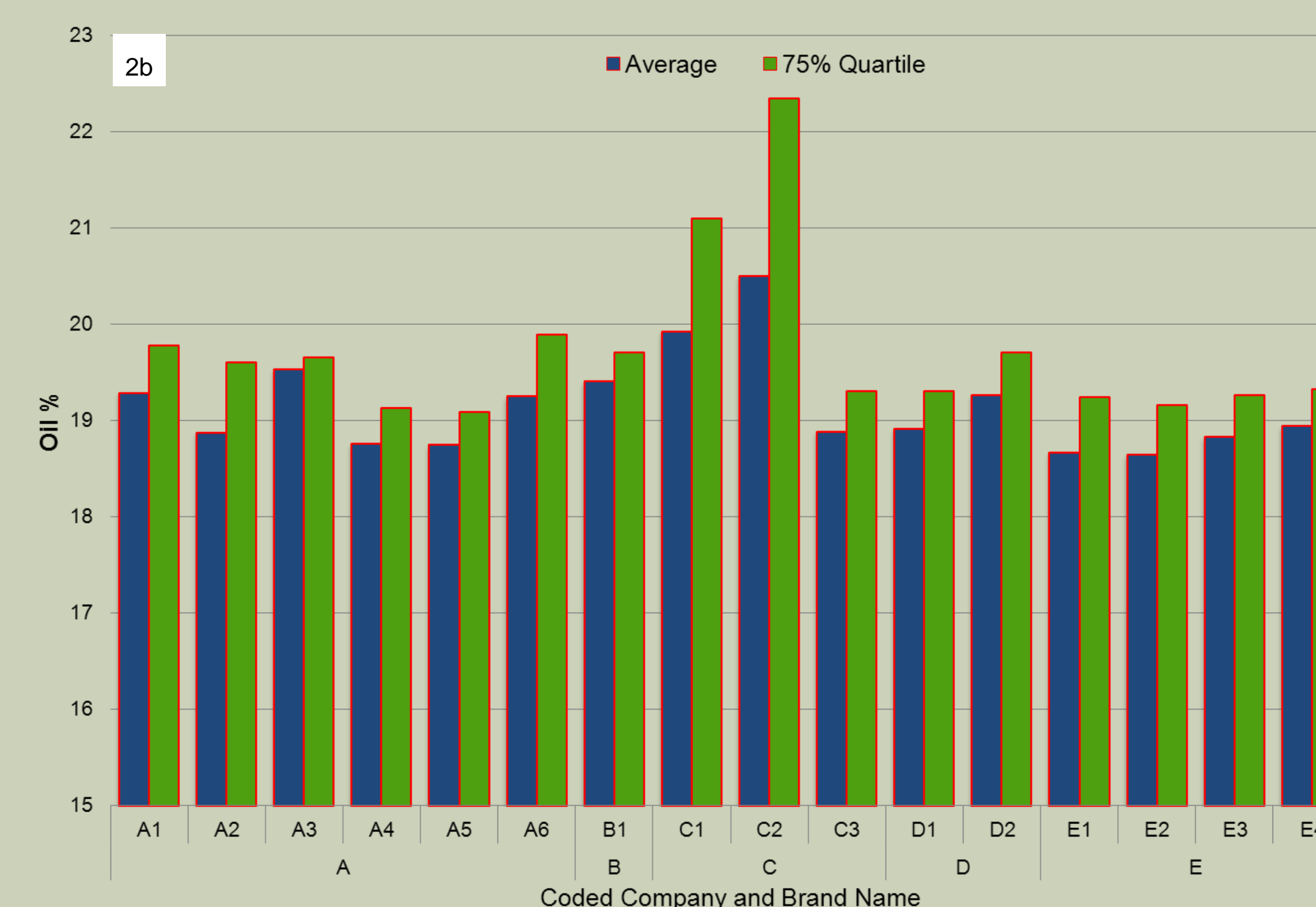
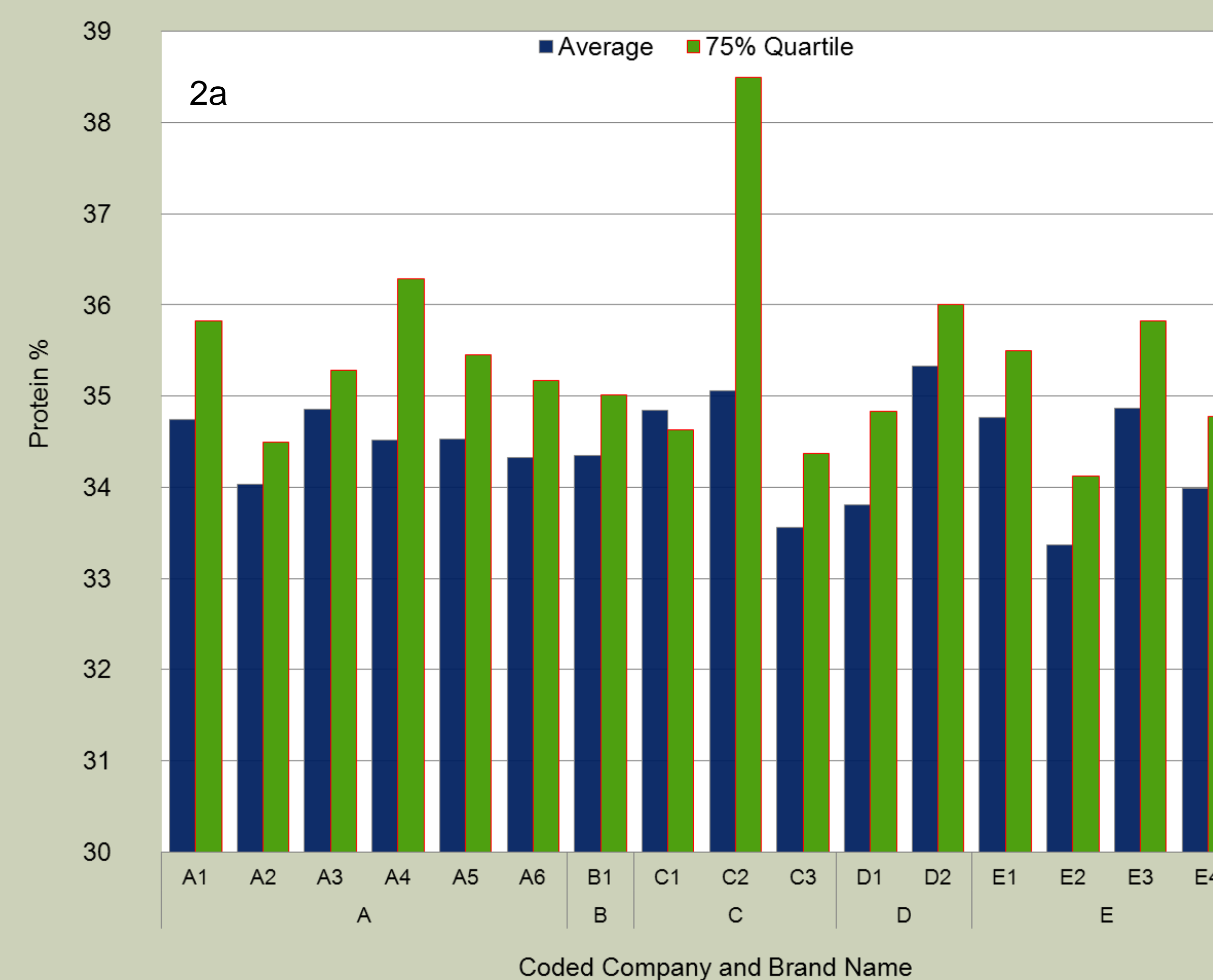
- ❖ Analysis of seasonal protein and oil data for most common hybrids had normal bell shape distribution with values aggregating around the mean. However, differences occurred in the peak and spread of the curve within and across brand names.
- ❖ Very few samples tested above the premium values set for protein (35%) or oil (19%)
- ❖ As expected, it was clear factors other than hybrid influenced soybean protein and oil. A hybrid may have very contrasting content of protein, oil or both at a similar location.
- ❖ The absence of accompanying yield data suggests caution in interpretation of the result.

Figure 1. Protein (1a) and oil (1b) values from hybrids listed to companies commonly marketing soybean seeds in Nebraska (company names are coded). S² = Sample variance, N = Number of samples



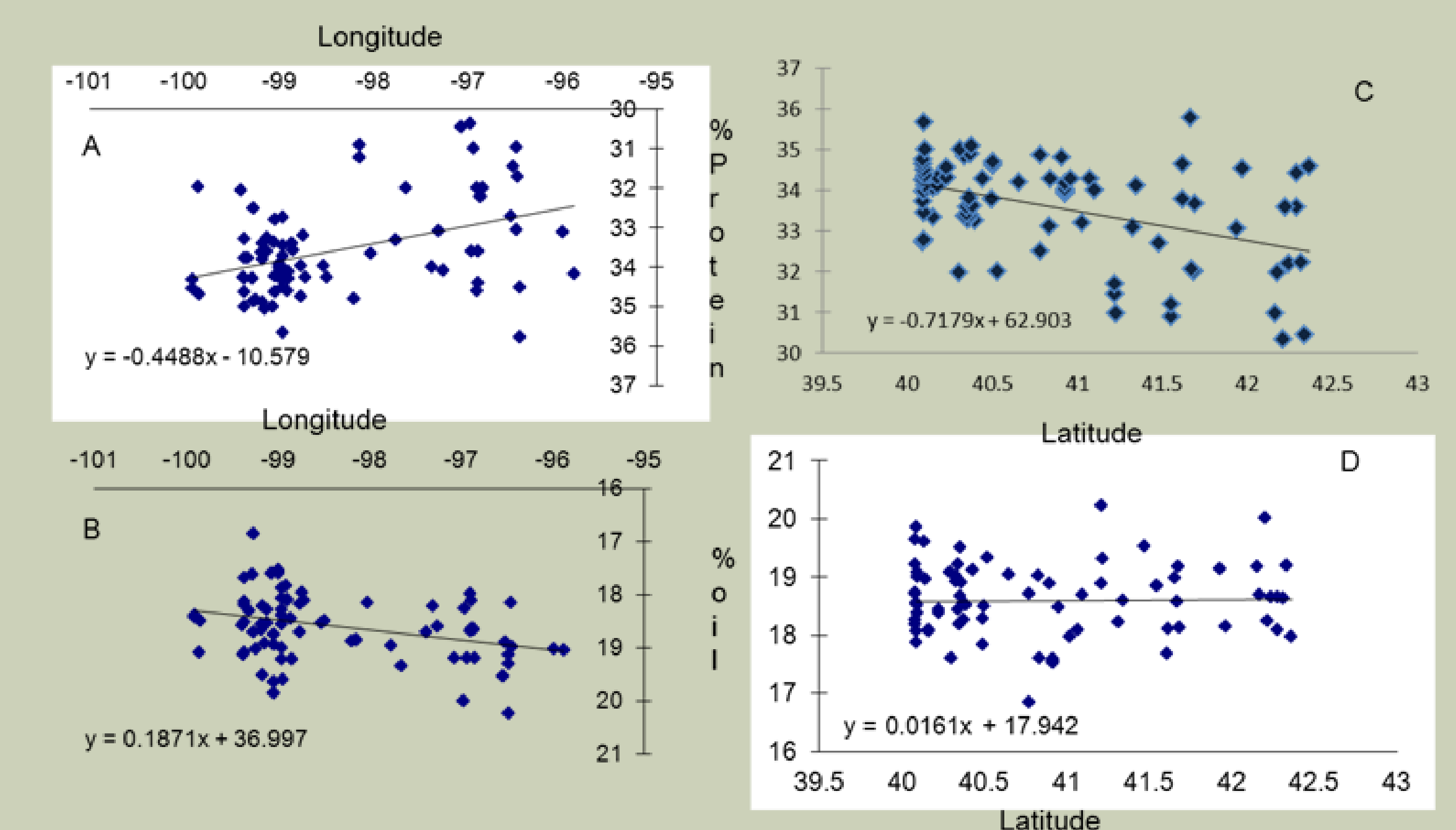
- ❖ Average protein is lower than the 35% premium cutoff point. In some cases, top 25% protein values are not high enough for premium.
- ❖ Companies with high protein hybrids also have high variance.
- ❖ Average hybrid oil percentage is above the premium value for most of the companies.
- ❖ In general, sample variance was low for oil indicating stable hybrid performance for oil than for protein.
- ❖ Companies that have high protein hybrids don't have high oil hybrids.

Figure 2. Percent protein (2a) and oil (2b) by brand names reported on the sample (company names are coded). S² = Sample variance, N = Number of samples



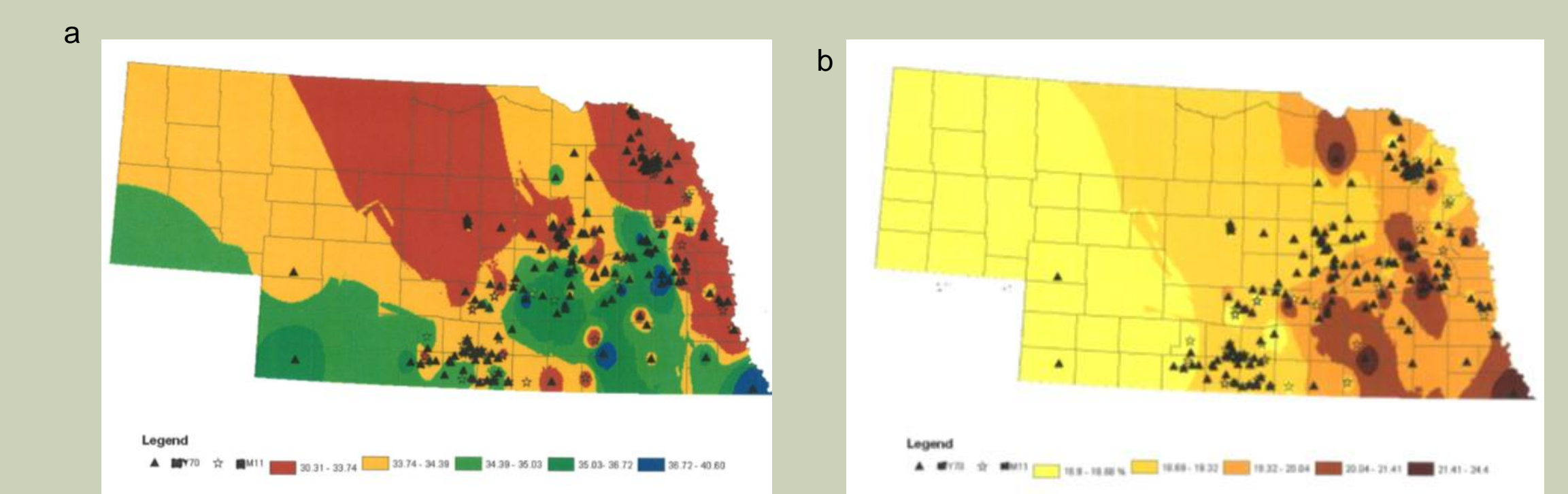
- ❖ Quality differences among brands across or within companies was very small.
- ❖ The farmer may get the same quality of soybean irrespective of the brand in most cases.
- ❖ Only two brands had mean average protein above 35%.
- ❖ Seven of the 16 brands have average oil above 19%.

Figure 3. Distribution of soybean protein and oil across Nebraska in relation to the reported growing location latitude and longitude.



- ❖ Protein percentage declined from south to north and increased from east to west.
- ❖ Oil percentage decreased from east to west with not change north-south.

Figure 4. Distribution of soybean protein (a) and oil (b) values overlaid on the map of Nebraska using special analysis.



- ❖ Local conditions strongly dictate quality variations and the soybean hybrids best suited to grow.
- ❖ Farmers are better served if all available hybrids are tested for performance by a 3rd party like University Variety Testing programs public universities.

CONCLUSIONS

- ❖ Many factors affect protein and oil quality of soybean. In this study only one factor, hybrid, was evaluated. Never the less, this study clearly showed farmers can benefit from clear demonstration of expected quality difference among brands marketed to them.
- ❖ Given the number of brands and hybrids available on the market, farmers will benefit from a 3rd party head to head testing of hybrid performance for yield and quality. This information will enable farmers to estimated potential value per pound from deciding to grow a hybrid.
- ❖ Most brands grown in Nebraska have comparable seed protein and oil percent. But it is not clear how probable yield differences among the hybrids affect the final estimated potential value from a hybrid.