

## Grow Ethanol Yield with Pioneer® brand HTF Ethanol Hybrids

Pioneer® brand High Total Fermentables (HTF) ethanol hybrids help farm operators deliver more grain with more EYP per bushel. All commercial Pioneer corn hybrids have been characterized and those with above average ethanol yield potential are designated as HTF ethanol hybrids.

HTF ethanol hybrids are available across a wide range of maturities and many contain Herculex® I insect protection helping to reduce insect damage which can help reduce the presence of molds and mycotoxins. This protection helps ensure a more consistent supply of high-yielding, high-quality grain.



Pioneer brand hybrids with the Herculex® XTRA^ technology provide:

- Broadest spectrum of above-ground insect control, for consistent and high-quality corn grain.
- Higher level of below-ground rootworm control, consistently expressed across all hybrid families.

## An Inside Look at NIR Technology

The first step Pioneer scientists undertake in NIR model development is to build benchmark reference chemistry which meets strict precision and accuracy criteria. Representative grain samples which are unique and discrete are collected and subjected to the benchmark reference procedure and the NIR predictive model is built from the resulting data.

For analysis of whole grains such as corn or soybeans, Pioneer uses near infra-red (NIR) technology, in a mode which measures the amount of light transmitted through a sample. Different constituents of the grains, such as carbohydrate, oil, protein, moisture and specific fatty acids, absorb near infrared energy in very consistent ways, making development of predictive models possible.

The Pioneer ethanol yield potential EYP calibration is available on the FOSS Infratec 1241 Grain Analyzer and is being marketed to dry-grind ethanol plants in North America.



# Pioneer QualiTrak™ System

## Integrated Grain Quality Information

## TECHNOLOGY THAT FUELS™

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## Measuring Ethanol Yield Potential in Corn

Pioneer developed the first Near Infrared (NIR) grain assay – known as ethanol yield calibration technology – to accurately predict the ethanol yield potential (EYP) in corn. The Pioneer calibration reports EYP in gallons per bushel.

Pioneer has licensed its ethanol yield calibration technology to FOSS North America for the Infratec 1241 grain analyzer. The FOSS Infratec analyzes data from incoming grain to report EYP for each load delivered. This value is captured and stored in the plant's grain accounting system along with traditional grain grade factors.

## Utilizing the Pioneer QualiTrak<sup>SM</sup> System

Running the NIR test with the Pioneer calibration typically takes about 50 seconds per sample. The result is an accurate analysis of functionality which both buyers and sellers of grain can use with confidence.

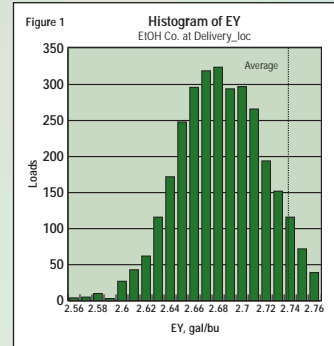
The Pioneer QualiTrak<sup>SM</sup> system helps both processors and growers understand the variation in quality of incoming grain. Current corn hybrids can vary up to 7% in EYP due to genetic differences. Crop management and handling practices can expand this range even more. Given this potential for wide variation in EYP in incoming grain, it is important to understand and track this quality information over time.

## Quality Grain Can Create Marketing Opportunities

The Pioneer QualiTrak system enables processors to share grain quality information with growers who deliver corn to their facility. This quality feedback system can help strengthen relationships since both growers and processors want to improve the EYP of delivered grain.

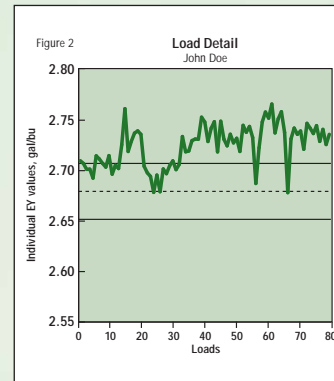
Growers receive an EYP grade on their scale ticket for each load delivered. The QualiTrak system also provides a load detail summary that compares the EYP of each growers grain deliveries to those of all others who delivered to the plant during the same time period.

In these examples, the farm operator's loads ranked in the top 96th percentile for EYP.



The dotted vertical line indicates the average EYP for all of the loads delivered to the facility by a specific grower.

- The histogram is a graphical summary of the EYP from all of the corn delivered to the plant over a given time period.
- EYP is measured in gallons per bushel



The horizontal dotted line is the average EYP for all loads delivered to the ethanol facility.

- Points above the top solid horizontal line represent loads in the upper 25th percentile of EYP
- Points below the bottom solid line would be loads in the bottom 25th percentile.

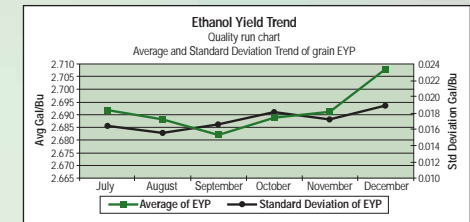
Sharing the QualiTrak system grain quality reports can help farm operators make better hybrid choices, improve crop management and grain handling practices which enhance the value of the grain corn delivered to the ethanol plant.

## Pioneer QualiTrak System Grain Quality Information is a Management Tool

The Pioneer QualiTrak system allows plant management to understand the total value of incoming grain. In addition to traditional grade factors, processors can measure ethanol yield potential which is directly linked to corn's value as a feedstock.

The Pioneer QualiTrak system provides a benchmark for ethanol plants by comparing their quality to a core group of comparable plants.

Plant Benchmark Plant NIR data vs. core group of plants			
	Your Score	Core Group	Difference
Minimum	2.510	2.540	-0.030
Average	2.708	2.685	0.023
Maximum	2.778	2.838	-0.060
Standard Deviation	0.019	0.023	-0.004



The QualiTrak system gives visibility to trends and variation over time and ranks growers for grain quality.

Vendor Ranking			
Top Ten Vendors (Current Month Avg EYP w/Min 5 Loads)			
1)	14785	2.756	6) 56321 2.729
2)	36985	2.739	7) 96854 2.726
3)	52147	2.733	8) 74859 2.725
4)	52369	2.733	9) 65989 2.724
5)	12365	2.731	10) 32322 2.724
Bottom Ten Vendors (Current Month Avg EYP w/Min 5 Loads)			
1)	77889	2.673	6) 55773 2.685
2)	99885	2.681	7) 33557 2.686
3)	44665	2.681	8) 35735 2.687
4)	33665	2.681	9) 75355 2.688
5)	22553	2.682	10) 95151 2.691

Grain quality and total fermentable carbohydrate content directly affect the amount of ethanol yield per bushel.

**Small variations in quality or carbohydrate content can make a big difference in the gallons of ethanol produced per bushel of grain.**

- Each 1% increase in ethanol yield potential can equal one million gallons of ethanol in a 100 million gallon plant.