Fiber Separation Technology™ and Generation 1.5 Grain Fiber to Cellulosic Technology™ are patent pending.

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Business Perspective
Generation 1.5: Grain Fiber to Ethanol Technology™
...sustain agriculture while advancing renewable energy.

- 102 Ethanol Plants, 18 Retrofits, Hungary, Canada, Mozambique, and Argentina
- R&D Services with Pilot Plant
Bio-Refinery – Increase Value, Diversify, Reduce Risk

310% Cellulosic Ethanol
300%
290%
280% Corn Oil
270%
260%
250% Ethanol
240%
230%
220%
210%
200%
190%
180% High Protein DDGS
170%
160%
150%
140%
130% DDGS
120%
110%
CORN 100%
90% Fiber + Syrup
80% Liquid Syrup

Soft Endosperm
Hard Endosperm
Fiber
Germ
Tip Cap

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D3 Cellulosic RIN ($0.57) = D5 Advanced ($0.62) + Cellulosic Waiver Credit ($0.50) – D6 Corn Starch ($0.55)
Fiber Separation Technology™

- Counter Current Washing
- No Additional Water Needed
- Watch Starch Loss
Fiber Separation Technology™ – Diversified Co-products

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Fiber is Just-In-Time Feedstock

- Truly Integrated vs Co-Located
- Reduced capital closer to Corn Starch
- $0.30 op ex. No additional Water or Acids
- 3.08+ Gallons per bushel yield
Fiber Separation Technology™ (FST™)

Fiber

Generation 1.5™

Fermenter

High Protein
DDG
45% Protein

Syrup

Corn Oil

Ethanol

Cellulosic Ethanol

Additional Oil

Additional Yield

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Generation 1.5 – High Protein DDG

› Low to no Fiber
› Lower Oil – 7/8% Fat
› High Protein – 42/45%
› Index off Soybean
› Monogastric
› Lower Volumes
Pretreatment

Hydrolysis/Fermentation
Generation 1.5 – Pilot Accomplishments

› 3rd Party Engineer/DOE Reviewed

› Full Scale Fermentations (585,000 Gal)

› Integrated process from feedstock to distillation.

› Reached technical targets:
  • Hydrolysis: >90% C6, >80% C5
  • Fermentation yields of >85%
Thank You!

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