



# APPLICATIONS



## CORNELL EFFICIENCY = SWEET SUCCESS

When a large Guatemalan sugar cane producer was looking to purchase numerous diesel driven pumps, Cornell proved that efficiency does matter.

A US-based engine packager was asked to provide a quote on ten (10) diesel pump packages capable of hitting a design point of 800 GPM at 280' TDH. Cornell's best selection was a 4HH-F16 capable of hitting the design condition at 1920 RPM with an efficiency of 84%. A local company was offering a competitor capable of hitting the design condition at 1800 RPM but with an efficiency of only 68%.

Cornell met with the end user in Guatemala to debunk their misconception that a diesel engine burns less diesel fuel and lasts longer if runs at 1800 RPM. Equipped with pump curves on both pumps, an engine performance curve on the Deere engine, and a fuel consumption comparison chart, Cornell was able to inform the customer.

Just as pumps have various RPM performance curves which show flow and head at a given RPM; diesel engines also have performance curves which show Hp, torque and fuel consumption at a given RPM. There are a lot of similarities to the curves. The main similarity is that both the engine and pump have gradually sloping curves. In terms of the engine it usually means that the best fuel consumption is not a defined point (RPM), but rather best fuel consumption covers a range of RPM's. With the engine performance curve, we able to show the end user that max fuel consumption was almost the same in terms of pounds of fuel per Hp per hour at 1800 RPM as it was at 1920 RPM.

The difference in fuel consumption was actually found in the pump performance. The end user had contracted fuel for the upcoming season at \$4.50 per gallon; based on past experience, they anticipated 1900 hours of run time for the season per pump. After calculating Hp required for each pump, fuel consumption, fuel price and estimated seasonal usage, Cornell saved the end user around \$2,800.00 per pump in fuel savings per season. That equates to over \$28,200 per year savings for the (10) pumps.

	Cornell 4HH-F16	Competitor
HP Required***	77	83
Operating RPM	1920	1800
Engine	Deere 4045TF250	Deere 4045TF250
Fuel Consumption (GPH)	3.85	4.18
Fuel Cost (US Dollars / Gallon)	\$4.50 (contracted rate)	\$4.50 (contracted rate)
Hourly Cost of Operation	\$17.33	\$18.81
Hours of Operation / Year	1900	1900
Yearly Cost of Operation	\$32,918	\$35,739
<b>CORNELL SAVINGS PER YEAR: \$2,822</b>		

