



CORNELL PUMP COMPANY

# APPLICATIONS

## AGRICULTURE



### CORNELL EFFICIENCY = SWEET SUCCESS

When a large Guatemalan sugar cane producer sought to purchase numerous diesel-driven pumps, Cornell proved that efficiency matters.

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 offered 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 it 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 that show HP, torque, and fuel consumption at a given RPM. There are a lot of similarities to the curves. The main similarity is that the engine and pump have gradually sloping curves. Regarding the engine, the best fuel consumption is not a defined point (RPM); instead, the best fuel consumption covers a range of RPMs. With the engine performance curve, we could show the end user that max fuel consumption was almost the same in pounds of fuel per Hp per hour at 1800 RPM as at 1920 RPM.

The difference in fuel consumption was found in the pump performance. The end user had contracted fuel at \$4.50 per gallon; based on past experience, they anticipated 1900 hours of run time 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 \$28,200 annually in 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> |                          |                          |