

Cut tractor fuel costs

As you're priming your equipment for fieldwork, the good news is fuel prices shouldn't be causing you too many headaches. Even so, spring is the perfect time to think about maximizing energy savings.

To measure opportunities for tractor fuel savings last spring, we worked with Randy Breach and staff at the Armstrong



Farm Energy

By DANA SCHWEITZER

Research Farm in southwest Iowa. Instrumentation was installed on a John

Deere 7420 for our trials. Our team decided against using a flowmeter and instead used 12-gallon auxiliary fuel tank on the side of the tractor (see photo).

A load cell was also placed under the auxiliary tank to measure the net weight of fuel consumed: the weight of the fuel supplied to the tractor's engine minus fuel returned from the engine. Fuel lines and



valves connected the auxiliary fuel tank to the tractor's engine.

All data was collected during one day using the same equipment under the same field conditions. A digital display mounted inside the cab of the tractor allowed the driver to gather data from the load cell during multiple passes with a disk. Four replications were done to ensure accuracy.

Consider depth of tillage. We compared tractor fuel consumption at two different depths with a tandem disk (see table). Reducing the tillage depth from 6 to 4 inches reduced diesel fuel consump-

Tandem disking at different depths			
Operation	No. of replications	Tillage depth, in.	Gal./acre
Disking	4	6	0.324
Disking	4	4	0.229

tion by nearly 30%. "These field trials at the Armstrong Farm illustrate a key point about energy savings," says Mark Hanna, ag engineer for ISU Extension. "Many opportunities to improve energy efficiency are also connected to decisions about management and conservation. Reducing your tillage depth by as little as 1 or 2 inches can reduce your fuel consumption."

Maintain your tractor. Diligent maintenance can boost fuel savings. Start by cleaning dust and debris from the tractor's radiator screens. The instrumentation, heating and air conditioning in the tractor cab require extra airflow. It goes without saying that extra dust can reduce the airflow necessary to cool the radiator. Over time, excessive heat from the radiator may cause extra wear and tear on engine parts and decrease engine performance.

Replace dirty filters. Replace fuel and air filters to boost engine performance and fuel efficiency, says Hanna. "To ensure maximum engine power with minimal fuel use, replace those dirty air and oil filters. Fuel consumption will likely drop by 3% or 4% with new, clean filters in place." The primary and secondary filters trap small particles as air and fuel enter the engine. As more particles build up over time, the flow of air and fuel in the engine's cylinders becomes increasingly restricted, thereby reducing combustion efficiency.

Limit idle time. Conserve diesel during daily activities, such as cooldown idling. A larger tractor will burn half a gallon of fuel or more in 10 minutes of idling, says Hanna. While a few minutes of idling after hard work is recommended to circulate cooling oil, particularly to the turbocharger, idling for eight or more minutes can be excessive. Three to five minutes of idling time may be sufficient for newer tractors; consult your operator's manual.

Schweitzer is program coordinator for ISU Farm Energy in collaboration with the Iowa Energy Center.

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