

# Kick the tires, check gauges to save on fuel

**I**F you're still riding high after last year's harvest and a mild winter, don't let rising fuel prices bring you down. Take a few minutes to consider fuel efficiency, weight distribution, wheel slip and ballasting as you prepare your tractors and field equipment for spring operations.

The table accompanying this column shows that optimal weight split between tractor axles is affected by the type of tractor and whether the attached implement is pulled or mounted. Since only wheels on powered axles supply traction, it's important to distribute total tractor weight properly between front and rear axles, according to Mark Hanna, Iowa State University Extension ag engineer.

For example, manure tank wagons have significant tongue weight and can be considered "fully mounted" drawbar loads because they add weight to the tractor's rear axle similar to fully mounted implements.

Total tractor weight is an important consideration to get the most tractive efficiency from your tractor, and proportioning that weight correctly between the front and rear axles is also critical.

If tractor axle weights are not known,



## Farm Energy

By DANA PETERSEN

they can be measured to gain confidence that fuel is not being wasted. Both total tractor weight and the weight being carried on each axle can be conveniently checked on commercial scales at your local grain elevator or co-op.

### Tire inflation saves fuel

By monitoring axle weight, you can calculate the load each tire carries, says Hanna. Correct tire inflation pressure can be found in the load and inflation tables available on the tire manufacturer's website or in the equipment operator's manual.

Hanna recommends using a good tire inflation gauge capable of readings within 1 to 2 pounds per square inch, or psi. Because underinflated tires wear sidewalls quickly, a natural tendency is to overinflate tires for a given load. Unfortunately, overinflation reduces contact of the tire's lugs

### Front-to-rear axle weight ratio as percentage of total weight

Tractor type	Towed/drawbar %front/%rear	Semi-mounted %front/%rear	Fully mounted %front/%rear
2WD	25/75	30/70	35/65
MFD	35/65	35/65	40/60
4WD	55/45	55/45	60/40

Source: Iowa State University Extension

with the soil and results in excessive wheel slip and increased fuel use.

### What about wheel slip?

It's often difficult to accurately measure wheel slip with the naked eye, but technology can help. Many larger or newer tractors have an option to display wheel slip to the operator. To maximize transfer of power from drive axles to the drawbar, wheel slip depends on the soil surface.

To avoid excessive fuel consumption, wheel slip should be approximately 6% to 13% on firm, untilled soil. More slippage is allowed on a tilled surface, 8% to 16%, and even more on a noncohesive sandy soil. Conversely, approximately 4% to 8% is optimal on concrete. Monitoring wheel slip on tractors equipped to display this information provides an easy check to determine if the tractor is optimally applying fuel and horsepower to the drawbar.

### Ballast for performance

As you prepare for fieldwork this year, adding and removing cast-iron ballast weights can be daunting, but proper ballasting improves tractor performance and fuel efficiency, says Hanna.

"Field operations that demand more of the tractor's engine power to be transferred to the drawbar require appropriate ballasting to maximize performance and optimize wheel slip," he explains.

Carrying too much ballast on a tractor dramatically reduces the wheel slip and also increases rolling resistance, causing fuel to be wasted as the tires push or "bulldoze" soil. Conversely, carrying insufficient ballast creates too much drive wheel slippage.

If you're anxious to begin springtime preparations, now is a great time to kick the tires and check the gauges. Remember to monitor tractor wheel slip and consider reducing ballasting during periods when the tractor will be used with lighter drawbar loads.

For tips on saving energy all around the farm, follow us on *Twitter@ISU\_Farm\_Energy* or download the fact sheets "Ballasting Tractors for Fuel Efficiency," PM 2089G, or "Shift Up and Throttle Back to Save Tractor Fuel," PM 2089M, from our website, *farmenergy.exnet.iastate.edu*.

Petersen is program coordinator for *ISU Farm Energy*, sponsored by the Iowa Energy Center.

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