

Rolling your way to fuel savings



Farm Energy

By DANA PETERSEN

If the recent fluctuations in fuel prices are bringing back memories of 2008, take time this year to get a jump on fuel savings. As you prepare your tractors and field equipment for spring, consider weight distribution, wheel slip and ballasting to improve overall fuel efficiency.

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

The table above shows that optimal weight split between tractor axles is affected by the type of tractor and whether the attached implement is pulled or mounted. 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 just like a fully mounted implement. Total tractor weight is an important consideration, but so is correctly distributing that weight between the axles of the tractor.

"It's only the wheels on powered axles that supply traction, so it's important to distribute total tractor weight properly between the front and rear axles," says Mark Hanna, Iowa State University Extension ag engineer.

If tractor axle weights are unknown, 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

"Once you know the axle weight, it's relatively easy to calculate the load each tire carries," says Hanna. Correct tire inflation pressure can be found in the load and inflation tables 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 psi. Because underinflated tires wear sidewalls quickly, it may be tempting to overinflate tires for a given load. Unfortunately, overinflation reduces contact of the tire's lugs with the soil, which causes excessive wheel slip and increases fuel consumption.

Wheel slip

To maximize transfer of power from drive axles to the drawbar, wheel slip will depend on the soil surface. To avoid excessive fuel use, 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 non-cohesive sandy soil. Conversely, approximately 4% to 8% is optimal on concrete.

It's difficult to accurately measure wheel slip with the naked eye, but many larger or newer tractors have an option to display wheel slip to the operator. Using this feature allows you to see if the tractor is optimally applying fuel and horsepower to the drawbar.

Ballasting

As you prepare for spring, removing or adding tractor ballast can be a chore, but proper ballasting improves tractor performance and fuel efficiency, says Hanna. Specifically, too much ballast will reduce tractor wheel slip and increase the rolling resistance, causing fuel to be wasted as the tires push, or "bulldoze," soil. On the other hand, carrying insufficient ballast creates too much drive-wheel slippage.

Don't let fuel prices get you down this spring. Remember to monitor tractor wheel slip and consider reducing ballasting during periods when the tractor will be used with lighter drawbar loads.

For more on farm fuel savings, download the fact sheets "Ballasting Tractors for Fuel Efficiency," PM 2089G, or "Shift Up and Throttle Back to Save Tractor Fuel," PM 2089M, at farmenergy.exnet.iastate.edu.

Petersen is program coordinator for ISU Farm Energy.



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- According to North Dakota State University weed specialists, if 10 percent of a waterhemp plant's seeds have resistance to glyphosate, then 2,500 of those plants will likely survive two applications of glyphosate. The next year that field could have 250,000 resistant waterhemp plants, and could possibly develop into 6.25 million plants by the third year.

At a recent summit on herbicide-resistant weeds in Washington D.C., experts reported weed resistance has spread to more than 12 million U.S. acres. Proper stewardship practices enable growers to prevent, manage or delay the spread of weed resistance and protect all useful technologies, which keeps efficiency and profits up in any operation.



Thomas Jacobs, an Arkansas LibertyLink® seed producer and grower, knows the effects weed resistance can have on long-term investments. "There are weeds resistant to DNA herbicides, sulfonamides and Roundup or glyphosate," Jacobs said. "Some farmers are losing all their technologies."

Resistance has been confirmed to five different herbicide classes in parts of the midwest. And is why, according to University of Illinois weed scientists, waterhemp resistance has changed the way growers have handled weed management in the past five years.

When weeds become resistant to more than one mode of action, management costs significantly increase. Liberty® herbicide, within the LibertyLink system, offers a unique mode of action to combat resistance frequently found in key driver weeds like waterhemp and Palmer amaranth.



Brad Barber of Mount Orab, Ohio, rotates LibertyLink soybeans within his operation as a key tool for resistance management while providing satisfying yields.

An average of **70%** of LibertyLink growers reported yields as good as or better than other varieties on their farms.*

"It's very easy to clean up resistant weeds with LibertyLink soybeans. I've never had it fail. It's amazing how well the program works as a resistance management tool." At 52 bushels per acre, his LibertyLink soybeans averaged 8 to 10 bushels an acre more than other soybeans on his operation.

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