



*The narrow wheelbase of compact tractors increases the danger of tipping while working on slopes.*

# SAFETY ESSENTIAL WHEN OPERATING COMPACT TRACTORS

## Characteristics that make them so handy command caution

By Scott Cotton

The increase in the sale and operation of compact tractors corresponds to the rapid growth in the number of rural homeowners.

These tractors are usually less than 35 horsepower, low profile, often four-wheel drive, and offer a wide variety of options and attachments. Some are small enough to be stored in an automotive garage. Features like these make compact tractors the obvious choice for managing tasks on smaller land sites.

John Deere and Case-International are joined in the compact tractor market by a number of foreign companies, including Kubota and Nordic. An increase in tractor-related accidents has been documented since 1999. Contributing factors include narrow wheelbases, lightweight frames, hydraulic capacity that exceeds tractor capability, a lack of weights, and a lack of training/experience by operators.

### **Narrow Wheelbase**

Many compact tractors have a wheelbase only 38 to 50 inches across. These tractors can be stored in small garden sheds and alongside cars in garages. Unfortunately, this

narrow wheel width greatly increases side roll tendency compared to wider-framed tractors. The center of gravity for most compact tractors is 16-20 inches above the ground, and the narrow width provides a very short leverage fulcrum to roll the unit. A tractor is likely to roll when operating on side slopes greater than 40 degrees or as little as 30 degrees if the attachment, such as a loader or other equipment, is raised above 18 inches while on a slope.

### **Lightweight Frame**

Compact tractors are designed with frames that minimize weight so they do not compress lawns or yards. This lightweight frame allows the tractor to be transported more easily, but it also makes it easier to tip and to roll. Due to the necessity for structural strength, many compact tractor implements such as front end loaders, mowers, snow blowers, and rototillers can often weigh half as much as the tractor itself.

### **Hydraulic Capacity**

To compensate for this mismatch of weight between implement and tractor, manufacturers have installed hydraulic systems on

compact tractors similar in capacity to those on much larger tractors. This hydraulic capacity can be the source of many problems – the most common of which is tipping. Many compact tractors have the hydraulic capacity (cylinders and pumps) to lift 700-1,000 pounds on front end loaders and over 1,000 pounds at the three-point hitch. The issue is many of these compact tractors can only lift about 500 pounds before either the back wheels or front wheels lift off the ground. Results can be tragic if the entire unit is facing upslope, downslope, or on uneven ground.

### **Wheel Weights**

Commercial and agricultural tractors often have wheel weights installed at the factory or by an implement dealer once the intended use of the tractor is determined. These weights counteract the tendency to tip forward or backward when lifting loads as well as lowering the center of gravity. Most compact tractors do not have wheel weights. In many cases, there are none available for these smaller non-production tractors.

### **Training and Experience**

Lack of experience or training

is the most consistent factor with compact tractor accidents. This is not based on lack of agricultural experience but rather on a lack of knowledge of this specific type of tractor. Many accidents stem from operating the tractor too fast, assumptions it can handle aggressive slopes, and simple errors such as turning uphill from a side slope with equipment lifted a little too high. One of the most common errors is not using the provided seat belt. Compact tractors are perceived as glorified lawn mowers (thus operators disregard the seat-belt), even though the 1,800-3,500 pound weight can crush anything it rolls onto.

Here are some basic safety precautions that can prevent most injuries:

- Read and follow safety recommendations in the owner/operator manual.
- Make sure bystanders and children are a safe distance away from the unit.
- Slow down for safety – speed aggravates every safety risk.
- Make sure Roll Over Protection System bars, safety guards, and connections are securely in place.
- Wear seat belt while operating the unit.
- Never allow children or novices to operate equipment.
- When lifting anything, operate slowly and on level ground.
- Avoid operating on slopes that exceed manufacturer tolerances.
- Keep implements as low as

possible when moving upslope, downslope, or along a side slope.

Compact tractors can help landowners manage a wide number of projects and issues. Safe operation can make sure they do not create new issues.



Some of the implements available for compact tractors. The weight of these implements should be considered when operating the tractor.

**Scott Cotton** has a wealth of safety knowledge. He is a National Extension Disaster Education Network (EDEN) agro-security specialist and is the Wyoming delegate. He can be reached at (307) 235-9400 or at [secotton@natronacounty-wy.gov](mailto:secotton@natronacounty-wy.gov).

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