

Guidance Systems: Show Me the Benefits

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February 2002

“My guidance system paid off in one year simply by relieving stress.” That comment by a farmer at the National No-till Conference in St. Louis, Missouri, last month got many nods of agreement from others in the room.

Placing a dollar value on stress may be difficult. But if you ever drove a spray rig through a field of drilled soybeans at 10 mph while keeping an eye on blobs of white foam 30 feet to your right or left, investing a few thousand in a device that lets you relax a bit more in the tractor cab may seem like a good deal.

We'll discuss specific economic benefits below. But first let's cover the costs. A Global Positioning System (GPS) based guidance system with an accuracy of about 20 inches costs around \$3000 to \$10,000. These typically use “light bars” or more expensive graphic displays, to help the operator steer in the desired path. This accuracy is fine for broadcasting fertilizer or spraying chemicals.

Auto-steer

An auto-steer system, accurate to within one inch, costs about \$50,000. These systems include \$25,000 for a tower with a 5 mile line-of-sight signal. That cost might be shared among neighbors using the same system. The driver gets the vehicle in approximately the right position at the end of the field, then the system takes over steering the tractor in a straight line. At the far end a signal, kind of like rumble strips before a sharp curve, alerts the driver to be ready to turn 180 degrees. Although this system does not replace an operator, 90 percent of the time he or she can let go of the steering wheel and concentrate on watching the equipment and gauges, or relax, talk on the phone, even work on a laptop computer.

John Deere recently introduced a \$15,000 system for its rubber tracked tractors, accurate to 4 inches, definitely precise enough for planting.

A \$50,000 system may seem expensive. But consider this scenario: for a 2000 acre farm, a 5 year useful life means a simple cost of \$5/acre/year.

Benefits

Many potential benefits apply for all guidance systems. For this discussion, I'll use an auto-steer system for the examples.

- Faster operating speed, perhaps a 0.5 mph increase on average
- Less fatigue, perhaps adding 2 to 4 hours per day with the same level of exhaustion and safety. (Or quit at the same time as usual, feeling relaxed and rested)
- The combination of these two (faster operation and longer days) could allow a farmer to add at least 10 percent more acres, farming 2200 acres instead of 2000.
- Nighttime operation is more feasible, perhaps as accurate as daytime. Spraying at night when there is less wind minimizes drift. Planting corn around the clock is an option to reduce timeliness costs and/or manage with smaller

equipment.

- Dust or fog (or driving toward a setting sun) does not affect accuracy as it does with human eyesight.
- Savings on inputs. To guard against skips, many operators often aim for about a 5% overlap. Precise driving can mean a 5% savings on chemicals, broadcast fertilizer and lime, broadcast seeds (no row markers), fuel, labor, and machinery depreciation.
- Savings on machine investment. Row markers and foam markers are not needed. Slightly smaller equipment (instead of farming more acres) is an option.
- Reduce compaction with controlled traffic for higher yields. This may offer the biggest payback.

Compaction and Controlled Traffic

Because I have worked on soil compaction in Ohio for fifteen years, you will understand my enthusiasm for the following point. If soil compaction is reducing corn and soybean yields by 5 percent, a guidance system that helps you adopt controlled traffic can increase income about \$15/ac, meaning the system could be paid for in 2 years.

If you buy technology that lets you drive in exactly the same paths year after year, why would you want to have parallel paths all over the field? Suppose, for example, you have the following machinery widths for a corn/soybean rotation: 12-row (30 ft) planter, 24 ft drill, 6 row (15 ft) corn head, 20 ft grain platform, 75 ft sprayer. The tire spacings will be haphazard and compact in various tracks.

Now, suppose that set of equipment is replaced with one where all equipment is 30 feet wide. (The sprayer would be 60 or 90 ft.) All tires would fit between corn rows, and create either 4 or 6 permanent traffic lanes every 30 feet.

Compacted paths improve traction, and 'wet weather' trafficability, providing benefits from more timely planting, spraying and harvest.

Bottom line

Several of these benefits, especially the ones related to compaction, can be realized without spending \$50,000, or even \$5000 on a guidance system. But if you really, really want one, black-out this last paragraph before showing it to the rest of the family.

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