



This skeptical farmer puts GPS guidance technology to the test and sees the light

By Philip Shaw*

LIGHTBAR GUIDANCE

gets passing grade

GPS guidance systems are a relatively new technology for agriculture. It's been 10 years or more since GPS-enabled yield monitors arrived on the scene, and their impact did not live up to the hype. Now, using GPS to help farmers guide their tractors across fields is gaining momentum. I had to find out more about this and whether there was a fit for my operation.

Like yield monitors, guidance systems use signals from satellites to pinpoint the location of your tractor. But instead of measuring yield, GPS guidance or parallel swathing technology is meant to help farmers be more accurate and efficient when doing various tasks on the land.

My initial reaction is to be skeptical. I'm not averse to new technology, but I need to be convinced that it improves on tried and true methods. In my younger days I connected small

chains to each end of my sprayer boom to make marks in tilled soil to guide me back through the field. When I changed to a bigger sprayer a couple of years ago, I resisted foam markers and instead used tile flags that I set out across the field in 60' intervals.

Never in my wildest dreams did I envision using a guidance system that employs signals from space that tell me where to point my tractor as I drive in my fields.

There are 2 options for farmers looking to use GPS guidance. A lightbar is the simplest and cheaper way to go. You mount a box with a row of lights in your tractor. The lights direct you how to steer to stay on course. You can also buy auto-steer packages. As the name implies, the satellite signal routes to your tractor's steering system and all you have to do is turn the tractor around at the headlands. For this

article, I focused on the lightbar approach.

There are numerous lightbar guidance systems available on the market. I was able to test a system from Trimble called the E-Z Guide Plus. Profota's Farm Equipment of Eberts, Ont., provided it for this trial.

The E-Z Guide Plus kit consisted of a receiver, the lightbar, brackets, suction mount and appropriate cables. The unit is powered by a cable plugged into the cigarette lighter in the tractor cab. It didn't take long to install. Within minutes of installation I was ready to roll.

I was really curious to find out just how accurate and consistent the system was compared to my own method. I spray using a 60' boom on a 750-gallon sprayer. Before I spray, I walk the headlands and use tile marker flags to mark 60' intervals for guidance. With an annual cost of about \$10 for tile

flags and a bit of exercise, I've always been pretty confident in my spraying accuracy.

The list price for the Trimble EZ-Guide Plus lightbar system is \$3,995. For my Gregson sprayer (60' boom) a 6-gallon foam marker system lists at \$1,550 and a 16-gallon foam marker system costs \$1,950. A 4-liter pack of foam marker solution costs \$62.

I used the lightbar for spraying soybeans with a post-emerge herbicide application. But I discovered there are a myriad of other farm applications where it can be used. According to Trimble their EZ-Guide Plus Guidance system is ideal for broadcast applications of fertilizer, lime and manure. Wide field cultivators and airseeders are also good candidates. It's a good fit for any job where you are using your eyes or instincts to determine the swath covered.

I wanted the guidance system to seamlessly replace my tile flags for guidance. I wanted to spray my field with confidence knowing there was a minimum of overlap or skip. Anything less than the accuracy I have with setting my own flags would fail my test.

I read the manual before starting. It gave me a general idea of what I was getting into. The software within the unit gives you several swathing options to choose from (see diagram). In my case I mostly used the AB pattern, although I did try the adaptive curve and headlands pattern.

With the AB pattern, I simply press a button to set point A as your starting point. Then I head toward the end of the field and at the end of the pass, I press a button to set point B. When I turn around at the headland, the LCD screen guides me to where I need to go to be exactly 60' parallel to my first swath. The lightbar guides me back up the field, parallel to that first pass.

The instructions say to set a swath at a foot less than desired to avoid skips between swaths. In my case that meant configuring the lightbar at 59'. A neighbor, who has the same guidance unit, confirmed this.

At first, I could hardly believe it. When I was traveling back beside my first swath, my eyes were following 3 green lights on the lightbar instead of peering into the distance looking for a pink tile flag. It seemed to work, but when I measured the distance between the 2 swaths, I was a bit too close — I was overlapping. I called Trimble and they suggested I reset the swath to 59'6".

The learning curve continued, but the technology worked seamlessly. I checked the spray swath continually. To my surprise it measured right on consistently across the field. In other words, the GPS system was keeping me just where I wanted to go, without tile flags, foam markers and my own eyeballing. Not being satisfied with that, I measured with a tape. It consistently measured 59'6". I had a hard time believing it. With this unit, I can actually move from field to field, storing distinctive AB lines.

As time went on, I became a believer, stopping occasionally to measure my work. In addition to parallel swathing, the LCD screen builds an ongoing map of where you've been, clearly showing the previous swath. It also displays any deviation from the parallel path and keeps track of the number of swaths or rounds you make

sun went down. As 10 p.m. rolled around I could no longer see anything beyond the reach of my headlights. As is often the case at night, there was little wind and excellent spraying conditions. At 10:30 p.m., I completely turned the tractor lights off, guided by only 3 small green lights on the lightbar. It almost seemed like a science fiction movie and I was the star.

Is it worth the \$3,995 price tag versus my \$10 annual cost in tile flags? At first glance, it would seem that I should continue to stake out my tile flags and get a little exercise. I have to admit, though, that no matter how good my eye is, the lightbar beats my flag system for consistency and accuracy. My fields are mostly flat and square, which made it possible for my flag system to work. Those with hilly or odd-shaped fields will likely find the lightbar even more compelling than I did.

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Cost of overlapping

	60' swath	50' swath	
Soybean acres	Chemical overlap cost	Fertilizer cost overlap	Total cost overlap
250	408.33	325.91	734.24
500	816.67	651.82	1,468.49
750	1,225.00	977.73	2,202.73
1,000	1,633.33	1,303.64	2,936.97

This table is based on a \$33 cost/ac. of Meridian Plus preceded by a \$16 cost/ac. burndown of Touchdown. Assume a 60' sprayer boom and a 50' swath for fertilizer spreading 150 lb./ac. of MAP at \$479/tonne.

in a field. The more I sprayed, the more comfortable I became.

One of the most useful features was the pause and resume function. When my sprayer emptied out, I simply pushed the pause feature. It enabled me to go refill my sprayer and then return to the exact same point where I left off. I then press resume and away I go.

For me, the true test for this gear meant taking the lightbar guidance to an environment where my tile flags just didn't cut it. I wanted to spray late into the evening after dark. If I were comfortable with that, it would open up timing efficiencies for my operation I had never considered before.

One evening, I kept spraying as the

There is a cost to overlap and skips. There is also a cost to taking valuable field time in spring and fall to set out and collect my flags. This needs to be taken into consideration.

The ability to spray at night when the wind dies down could easily double or triple my acres sprayed per day. We've all been frustrated when the wind just won't stop blowing during that short window when post-emerge products must be applied. And when spraying beside sensitive crops like sugar beets and tomatoes, evenings offer the best timing to prevent drift damage.

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In the future I can see myself doing more in-crop applications such as fusarium head blight control in wheat, and aphids or rust treatments in soybeans. For these examples, the heavy canopy would create challenges for both my tile flags and for foam marker dollops. The lightbar would work well in this environment.

Let's look at the economics of accuracy. Most of us tend to overlap when in doubt. If I overlap by 24" using my 60' sprayer boom, it would mean I would be over-applying by 3.3% and I would waste 2" of boom capacity. If I overlapped the same amount when spreading fertilizer with a 50' spreader I'd be over-applying by 4%.

Depending on your degree of overlap, the table shows that lightbar guidance can pay for itself quite quickly depending on the acres you cover and how much you use it.

There can be problems with lightbars. The satellites responsible for the guidance are in equatorial orbits so satellite reception is better closer to the equator. According to Trimble, the further north you are located, the more chance that obstructions (buildings or a line of trees) to the south of your field may block the signal. Although I had no problems, that possibility exists.

Should I take my markers off my planters and rely solely on guidance? Would that enhance hard-to-do planting jobs such as seeding wheat on an autumn night? I have no experience with this, but it would seem there is nothing stopping me. When speaking with area farmers who use guidance I was told guidance enhances the job that markers do for night wheat planting. In fact, it might make the difference in getting a field planted when rain threatens. For other crops like soybeans and corn, planting with 15' drills and 6-row planters may not

represent the best use of guidance technology.

Is it worth the \$3,995 versus the \$1,550 or \$1,950 for foam markers? Trimble maintains that using GPS guidance enables you to drive 13%–20% faster versus using foam markers. Farmers need to evaluate that for themselves. Lightbar guidance systems can be updated to automatic steering. They also can mesh

with computers for field information management.

After this experiment, I think lightbar guidance is in my farming future. I think it can be an effective tool to eliminate skip and overlap and allow you to do a better job on certain tasks. For me, being able to spray at night with confidence is the biggest advantage of a lightbar guidance system. *cg*

I THINK IT CAN BE AN EFFECTIVE TOOL TO ELIMINATE SKIP AND OVERLAP AND ALLOW YOU TO DO A BETTER JOB ON CERTAIN TASKS.



I need a cutline for this photo. That would really be great. And, maybe for the other photo too please. Thanks.

