

Advertisement

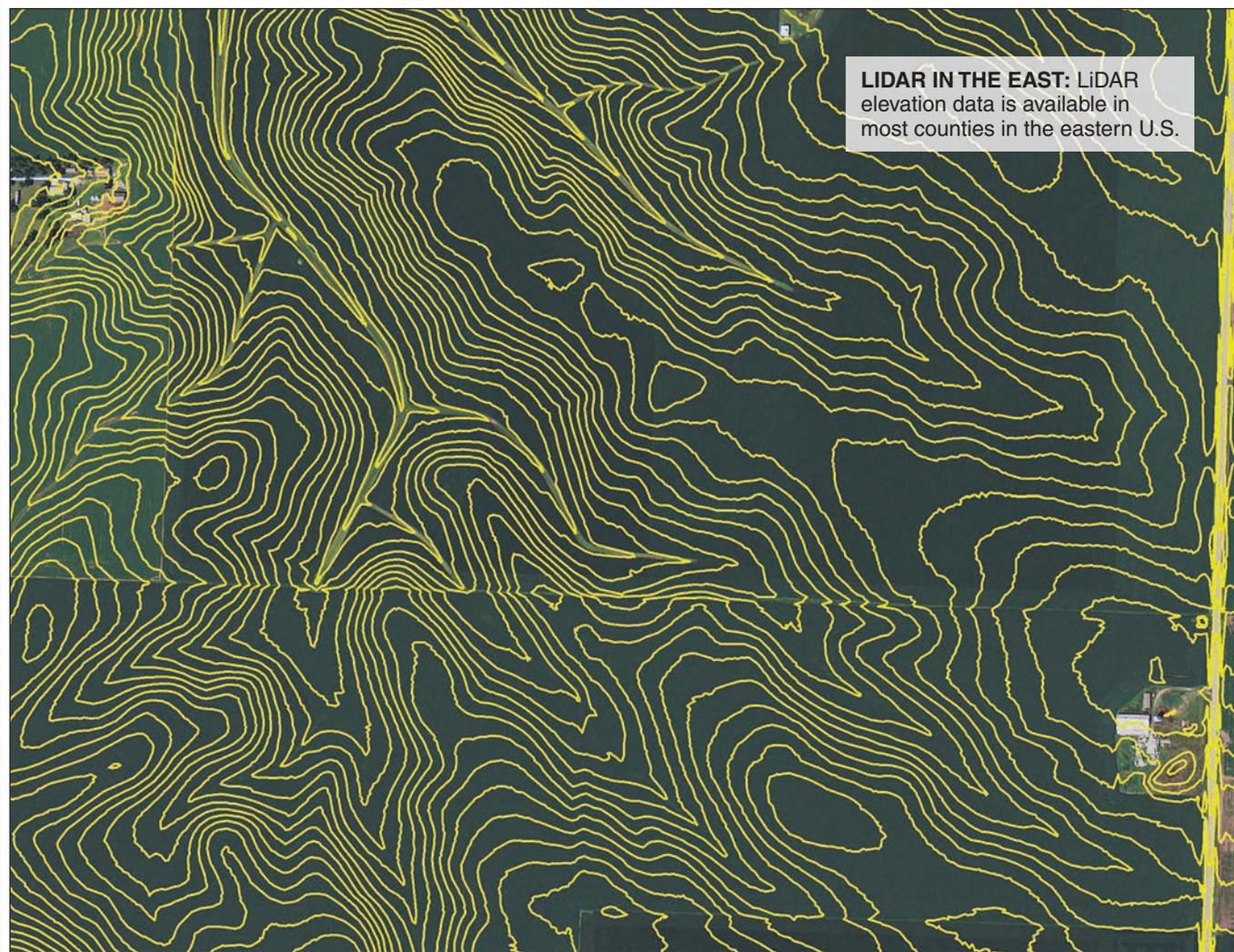
**Trait Stewardship Responsibilities  
Notice to Farmers**

Certain statements contained in this presentation are “**forward-looking statements**,” such as statements concerning the company’s anticipated financial results, current and future product performance, regulatory approvals, business and financial plans and other non-historical facts. These statements are based on current expectations and currently available information. However, since these statements are based on factors that involve risks and uncertainties, the company’s actual performance and results may differ materially from those described or implied by such forward-looking statements. Factors that could cause or contribute to such differences include, among others: continued competition in seeds, traits and agricultural chemicals; the company’s exposure to various contingencies, including those related to intellectual property protection, regulatory compliance and the speed with which approvals are received, and public acceptance of biotechnology products; the success of the company’s research and development activities; the outcomes of major lawsuits and the previously announced SEC investigation; developments related to foreign currencies and economies; successful operation of recent acquisitions; fluctuations in commodity prices; compliance with regulations affecting our manufacturing; the accuracy of the company’s estimates related to distribution inventory levels; the company’s ability to fund its short-term financing needs and to obtain payment for the products that it sells; the effect of weather conditions, natural disasters and accidents on the agriculture business or the company’s facilities; and other risks and factors detailed in the company’s most recent periodic report to the SEC. Undue reliance should not be placed on these forward-looking statements, which are current only as of the date of this presentation. The company disclaims any current intention or obligation to update any forward-looking statements or any of the factors that may affect actual results.

This information is for **educational purposes only** and is not an offer to sell **Roundup Ready 2 Xtend™**. This product is not yet registered or approved for sale or use anywhere in the United States.

**Commercialization is dependent on multiple factors**, including successful conclusion of the regulatory process. **The information presented herein is provided for educational purposes only, and is not and shall not be construed as an offer to sell, or a recommendation to use, any unregistered pesticide for any purpose whatsoever.** It is a violation of federal law to promote or offer to sell an unregistered pesticide.

**ALWAYS READ AND FOLLOW PESTICIDE LABEL DIRECTIONS.** Roundup Ready 2 Xtend™ and Xtend™ are registered trademarks of Monsanto Technology LLC. All other trademarks are the property of their respective owners. ©2013 Monsanto Company. MDIC-FP-13020 LC



## Farming on the contour gets more exact with elevation data

By LYNN BETTS

**L**ET’S say you’ve come to the point where you’re using no-till or till-plant systems with technology like auto-steering and obtaining most of the benefits of precision farming. That’s great news. If you’re farming fairly level land, or sloping land with terraces or other practices that have established row patterns that fit the contour of the land, you’re set.

But what if you have the opportunity to rent or buy some rolling land that is being farmed uphill and downhill?

Contour farming, one of the most cost-effective soil conservation practices, brings elevation, the third coordinate of spatial relationships in real-world farming, to the forefront in row-pattern consideration.

Soil loss reductions with contouring vary widely, depending on severity of storms, length and steepness of slope, amount of ground cover, and height of soil ridges formed by tillage or planting equipment. Contouring can save large amounts of soil—especially when heavy residue is left on the field to encourage water infiltration.

Farming around the hill also guards against seeds or young plants being

### Key Points

- Contouring is not dead, but few people know how to lay out systems.
- Autosteer helps, but more so on flat land or where terraces are installed.
- Steering systems for cost-effective contouring consider elevation, too.

washed out of the row, along with the best of your topsoil, during heavy rains.

### Contouring a lost art

Old-time conservationists called contouring an art as much as a science. It seems simple enough to follow the contour of a slope around the hill. But in practice, goals of contouring also include developing a pattern that promotes long rows, eliminates as many point rows as possible, and maintains grassed waterways with row directions that neither erode soil nor dump sediment into the waterway.

The know-how, software and hardware exists to lay out and drive contour lines from your own tractor cab — if you live in the right county in the right state. The power behind contours, LiDAR elevation data, is available in certain counties from the Great Plains to the East Coast.

Tom Buman, president of Agren in Carroll, Iowa, has seen the expansion of light detection and ranging, or LiDAR, mapping across the country. For several years, his small firm has been developing and licensing time-saving conservation software

for USDA, state and local conservationists in locating and making estimates for practices like ponds, waterways and terraces.

“Very few field offices still stake out contour lines for a farmer to follow in planting,” Buman says. “And frankly, it makes much more sense to use elevation data. Where LiDAR is available, a conservationist — public or private — can use LiDAR contour maps to draw contour lines on a map without having to walk and survey a field.

“In the very near future, I think conservationists will be able to provide an electronic file copy of the key contour line to the farmer quickly. Autosteer companies already have the capability to transfer tile lines to autosteer. It won’t be long until they figure out how to upload a key contour line file to the steering system, too.”

Buman’s company develops software that formats LiDAR data and makes its use state-specific for conservation purposes. He notes that such technology is quickly becoming ingrained in farming today.

“Robots are in development now that will identify and zap weeds” Buman says. “Some scientists are envisioning intelligent robots that talk to each other to monitor, collect data and care for plants in ways far beyond what are economically feasible today. They see swarms of small bots that will monitor soil conditions, photograph and analyze plants, and detect insect infestations and diseases before they become widespread. The question is,” he says, “will conservation technology keep pace?”

*Betts writes from Johnston, Iowa.*



**TOM BUMAN**