Winning the Weed War: A northern Colorado county combats weeds more effectively using GPS technology

By Cori Keeton Pope
A case study from Tripod Data Systems, a Trimble company

As farmers take to the fields to begin planting in Colorado, so do the weed management workers who are responsible for spraying, tracking and analyzing weed control efforts for farmers and government agencies, as well as enforcing noxious weed laws.

But it's not just about spraying. Teams of weed control workers out there in trucks and four-wheelers drive along country roads and not only spray for weeds, but also record everything on paper. An observer to this "system" was Elaine McCallum of software developer Red Hen Farming Systems.

"They would stop every mile or so to write down where they were in relation to geographic markers, what weeds they identified and what sprays they used," she said. "The process was time-consuming and the information extremely difficult to analyze."


This ATV, equipped with a rugged TDS Recon handheld computer and Trimble AgGPS EZ Map software, is ready to help pinpoint and record weed problems.

It led McCallum and her team to engage the Larimer County Weed Control District in northern Colorado on a pilot project in May of last year. The object: to streamline the documentation aspect of the weed control specialists' job.

The Equipment
Red Hen began by equipping two of Larimer County's eight weed management trucks with Recon rugged handheld computers from Tripod Data Systems. Each Recon was equipped with a CompactFlash Card with global positioning system (GPS) capabilities and was connected to the truck via a serial cable. In addition, each Recon was loaded with AgGPS EZ-Map software from Trimble, designed specifically for field and environmental data logging and mapping. "Most of these guys don't even use a desktop computer on a daily basis, so we knew that the technology had to be user-friendly and easy to learn," said McCallum. The Recon fit the bill, she says, because it's small, lightweight, and most importantly, able to withstand "in the field" punishment.

Following training, the workers took to the roads with their new equipment. Now, with the GPS unit automatically tracking the territory covered by each truck on the computer throughout the day, and using the handheld computer as they traveled throughout the county, the workers could quickly and easily indicate which weeds they were spraying and the kind of spray being used.

At the end of each day, the workers returned to the office and downloaded the information onto a desktop computer running Red Hen's FarmGIS desktop

management tool. Using this, Larimer County Weeds could automatically create electronic maps and reports indicating what kind of weeds were sprayed, how many feet each worker covered, the exact territory each truck covered per day and other analysis about the time, date and cost of each task.

In just a few months, Larimer County Weeds reduced the time and costs of documenting weed management tasks by more than 50%.

"When the workers didn't have to stop the truck every mile or so to write down where they were, what time it was and what they were doing, efficiency in the field skyrocketed," said McCallum. "The time-savings was recognized across the organization, from the workers in the trucks to the people responsible for invoicing."

The county plans to move the "pilot" project to full implementation this year, adding the system to its entire fleet.

Expanding Use
In addition to using Red Hen's solution for roadside weed management, Larimer County also implemented the technology for use by noxious weed enforcement and spray system teams.

The Colorado Noxious Weed Act requires that specific noxious weeds must be mapped and managed in an efficient manner throughout the state. Now, with the GPS and GIS solution from Red Hen, noxious weed enforcement teams traveling by truck or on foot utilize the GPS-equipped Recon to log the location of noxious weeds throughout their territory, typically located on farm property or public land. Back in the office, maps and detailed reports about the location of noxious weeds can be easily created from the field data.

In addition, FarmGIS automatically creates assignments based on the types of weeds at their location. Each day, workers responsible for traveling throughout the county on four-wheelers to spray for noxious weeds receive automatically generated to-do lists of the day's priorities.

"A Recon is loaded on each four-wheeler, which is also equipped with a boom system and sprayer," said McCallum. "The worker can flip a switch on the sprayer to activate the GPS component, and the unit automatically records where he is and what he is spraying."

Not surprisingly, the end result was a 40% reduction in worker time spent looking for noxious weeds, and the number of noxious weed enforcements doubled in 2005.

"By automating the data collection that used to be done completely by hand, Larimer County Weeds has seen a tremendous jump in worker productivity and cost-savings just in the course of the year," said McCallum.

About Tripod Data Systems
Tripod Data Systems(TDS) designs and manufactures mobile computing systems for extreme outdoor and industrial environments. The rugged TDS Recon™ and Ranger™ handheld computers help users collect accurate field data and work more productively in public safety, field service, utilities, military and other outdoor or service-related applications. Both TDS handhelds meet military specifications for

drops, vibration, immersion and temperature extremes, and with an IP67 rating, they are impervious to water and dust.

TDS is a wholly owned subsidiary of Trimble. TDS is headquartered in Corvallis, Ore., and was founded in 1987. For more information about TDS, visit www.tdsway.com, e-mail handhelds@tdsway.com or call 541-752-9000.

Cori Keeton Pope is a freelance writer covering a wide variety of subject fields. She can be reached at cori@keetonpr.com or 303-282-4981.

This case study first published in *Precision Ag: Special Reports*, Spring 2006.