WESTERN FARM PRESS

GPS mechanical tree, vine planter offers greater efficiency

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By Harry Cline

New system taking the guesswork out of orchard, vineyard installations

KERMAN, Calif. - California's 2.5 million acres of orchards and vineyards are one of the more amazing sights in agriculture. They feature row after row of trees and vines ridge-line straight in symmetrical beauty.

That precision always begs the question: How do they plant those rows so straight? Mostly with a long tape measure and white paper bags to mark rows and long lengths of trellising wire or string stretched down rows notched with tape, fishing weights, white paint, pieces of wire or just about anything handy to mark exactly where young vines and trees are to be planted.

It an inexact art form that has stood the test of time. Imprecise because what you see is not always what you see. A matter of a few inches in inaccurately laying out an orchard can produce years of headaches in managing water, cultivating, running vineyard cane cutters or spraying an orchard or vineyard, according to Kerman grape growers Mickey Kenneson and nephew Steve Dee.

"I have seen vineyard rows off as much as 2 feet," said Dee. That does not sound like much, but, when that happens, the grower is stuck with it for the life of the orchard or vineyards.

"It can mess up everything you do in a vineyard," said Dee.

Jason Hornor grew up on his family's farm. He also knows what incorrect spacing can mean.

"There are a lot of no-till orchards today where growers only spray the berms with herbicides," said Hornor. "If your rows are not evenly spaced, it makes a difference in controlling weeds on the berms and controlling where you spray the herbicide because the spray boom is a set width and your orchard rows may not be."

Hornor, based in Kerman, has been operating his family's mechanical tree and vine planting business for five years. Until a year ago, he physically laid out orchards and vineyards, using the time-tested measuring tape and bag method before planting with mechanical planters.

Hornor has since borrowed a page from row crop precision agriculture, investing in a Global Positioning System PS AutoFarm tractor guidance system for his planting business. It is one of only a few GPS mechanical vine and tree planting systems operating in the state.

It has brought a new level of precision, confidence and efficiency to planting trees and vines that even surprised the people from AutoFarm.

Hornor uses the guidance system to first measure the field and program into the computer the row spacing desired by the grower. Growers also tell Hornor how they want the vineyard or orchard laid out in reference to adjacent vineyards or orchards and power lines.

However, the computer really shines when fields are not perfectly rectangular or square.

For example, fields are often wider on one side than the other. With the GPS computer, Hornor can imperceptibly taper each row to compensate for the irregularity...taking as little as 1 inch from each row to compensate for a field taper of several feet.

No two orchards or vineyards are the same. For example, vineyard row spacing can range from 9- to 12- foot wide rows and vine counts from 500 up to 1,100 vines per acre. Tree rows and spacing also can differ.

After he programs in the field's dimensions and how the farmer wants the orchard or vineyard laid out, he pulls a marker implement across the field perpendicular to the new rows using the GPS-guided tractor. The marker looks like a spring-tooth harrow with rigid teeth.

Workers riding mechanical tree or vine planters down the rows then insert the new, dormant vine or trees into the ground as the planter crosses the perpendicular marker lines. The tractor is automatically steered with the AutoFarm GPS system.

Much tree and vine planting is still done by hand because that is how it has been done for decades. In many cases, growers are not aware mechanical planters are available.

Labor for hand planting is still readily available since planting is done in the late winter or early spring after many pruning. "You can hire 100 people, and they can plant 160 acres pretty quickly." Hornor pointed out.

Nurseries use mechanical planting because it tends to open up the soil more than hand-digging individual holes.

Even though mechanical planters are preferred by nurseries, they are often given a bad rap, admits Hornor, because farmers believe they are not as accurate as hand planting.

Accuracy has become a non-issue, especially with a GPS guidance system. "I think mechanical planting is overcoming its bad reputation. As for speed and efficiency, mechanical planting cannot be beat," Hornor said.

"I cannot claim perfect accuracy, but it is much improved with the GPS system," said Jason.

Hornor's business keeps him busy six months of the year. However, it can be a harried half year. Planting an orchard or vineyard is all a matter of juggling getting the land ready, having trees or vines available from the nursery and having the planter is available.

Mechanical planting has a big advantage in efficiency, especially at the peak season. Many times growers are finishing their ground prep, then need berms or furrows made and trees planted all within a short time frame. For this reason, growers like to call in a mechanical planter like Hornor because his machines build berms or furrows at the same time they is planting, all with GPS accuracy. Hornor's crew can plant up to 30,000 vines per day and have planted up to 10,000 trees per planter in a day.

Hornor said his AutoFarm system has opened up new business areas for him where mechanical planters have not been used before.

In the central valley, fields are mostly even and flat and there are no impediments to machine planting. However, "the more you go north the more irregular and hilly fields can be," said Hornor. These fields can be difficult to lay out, but "with GPS, hills and odd-shaped fields are not a problem laying out and planting. GPS really shines there," he said.

Also with the GPS auto guidance system, Hornor can maximize daylight planting time by laying out a field the night before and being ready to plant the next morning. He can also plant in low visibility, foggy conditions. Hornor has also used the AutoFarm system he calls "very user friendly" to lay out pre-planting ripping lines down rows and for in-row soil amendment applications. It has also been used to lay out micro-irrigation systems.

Deane Malott, marketing manager for the AutoFarm system, said the system that is sold to guide row crop tractors is well suited for what Hornor is using it for..."steering a straight line and to measure out fields.

"And because our system does not use gyros, it never loses its orientationat slow speeds or even stopped," said Malott. That is important at the very slow speeds Hornor is moving planting trees and vines.

However, Malott admits he was surprised once he met with Hornor and saw exactly how he was utilizing the auto-steer GPS technology.

“I did not quite understand the power of what the system could do until I listened to Jason and another tree and vine planting customer as to what it used to be like planting trees and vines and what it is like using GPS,” said Malott.

“It was breathtaking to see the impact it was having in laying out a field much more quickly and keeping everything so straight,” said Malott.

Hornor said GPS technology has not made the tractor move across the field faster because workmen still must hit the spot where the tree or vine should be planted. However, from the start when the field is laid out until it is finished, it takes much less time, he said.

“It has made the business of mechanical planting much more efficient.”

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