

grape growing

Product Review:

Vineyard Management Support Software

In the last five years, significant changes and improvements have been made to vineyard applications.

Mark Greenspan



The information management concept has matured and is finding its way into formerly Luddite-like hands.

FIVE YEARS AGO I inquired with tongue implanted in cheek: How can anyone grow winegrapes without a database? Only five years ago, this was a bit of a joke, and most growers were still using, at best, spreadsheets to track their data and, at worst, scratching pencil lead against paper and filing it away, never to be seen or heard from again. Five years later, the joke is no longer cute. It really does not seem possible to grow grapes without a data system. Labor and pesticide regulations, farming cost reduction, food supply and water use documentation requirements, plus countless other factors, are making the process of grape farming an impossibly complex task without some way to track and report on the enterprise. No longer is it just “cool” to have a data system; it is now a necessity.

I can think of very few growers who do not use some sort of electronic data system. While some are still in the spreadsheet stage (which works fine for small growers), most average to large growers have seen the light and are at least trying out some of the available applications out there. Growers that were slow on the uptake of cell phones now have smart phones and tablet computers in their pockets and pickups. The information management concept has matured and is finding its way into formerly Luddite-like hands.

I was asked to do this software review by *Wine Business Monthly* and was not excited to do so. Not that this doesn't interest me. I have used two data systems in my consulting practice and have experience with other systems

as well. I was hesitant because I knew that the field now was quite different from what it was during my last review. Not only are there more players in the field, but the ones that were there before have made great improvements to their products over the years in response to user requests, customer-chasing efforts and their own ingenuity.

What has changed? Well, for one, it is not cool to call software “software” anymore. We now must refer to them as “applications.” I could use the geek-chic abbreviation “app,” but this is too hip a magazine for that pedestrian nonsense. Five years ago, these applications were more focused on viticultural monitoring

and management, and less on the business aspects of grape growing. Because of that, I think that many of the companies struggled to enlist customers. Personally, I see the value in the viticultural monitoring features, but many companies did not, apparently, see the business value in monitoring mildew or tracking pressure chamber values. They wanted to solve the management nightmare of how to manage labor, machinery, materials and the tasks they were used for—and how to keep track of those costs over a management unit (i.e., block, ranch) so that the costs could be compared to revenue to determine if the block/ranch was making a profit or not.

So, the main difference between vineyard applications of 2006 and 2011 appears to be that of vineyard management information systems. Managing vineyard labor can make one's head spin. There are so many ways to pay la-

bor for its services—base hourly, task-based wages, piece rate, piece rate with hourly minimums, crew-based, individual-based, associated with equipment, etc.—that the data systems must be incredibly flexible to accommodate all of the permutations. Add to that pesticide applications tracking and reporting, equipment maintenance scheduling, field time sheets and payroll functionality, and you can see that there is a gamut of needs screaming for a system to bring it all together.

For this review, I only considered applications that were data systems for vineyard management. There are countless software solutions for some aspects of vineyard operations, such as irrigation management and GIS mapping. That is too wide a net to cast for this article.

I was expecting a few key players along with a few also-rans this time but was blown away by all of the companies here. I did not know how I would rank and stack the capabilities of these applications. While some have limited

functionality, the functions that they do represent demonstrate a great deal of development effort. Because of that, I chose not to rank and stack vendors or to make mention of their shortcomings. Partially, that is because it is not possible to spend an hour with each of these companies' products and hope to learn or remember enough to compare one against another. I thought it better to list the features I thought were most important and state how each product addressed those features (if they tried to). This review is more of a buyers' guide than a review. Use it, if you wish, as a foundation for your own search. Contact the companies that you are interested in and see which ones have the look and feel that work for your organization and the functions that are essential to your business. Finally, I did my best to discover and represent the major players in the data system "space" (on the matrix that accompanies this article). It is quite possible that I left out a company or two, but that would have been inadvertent.

The Buyers' Guide

General considerations when looking for a vineyard database package:

1. Are you a grower, a winery or a winery with estate vineyards? Some of the software packages are geared more for operations, including budgeting, cost tracking, labor management and regulatory compliance. Others emphasize viticultural practices and quality monitoring. Some are suited for vineyard management companies that bill out costs to their customers. What do you want this database to do for you?

2. Customization and flexibility. Every grower and winery have different priorities on what they are measuring. Additionally, they might use different terminology in referring to the same information. The software should not force you to change your practices or technical jargon to suit its needs. It should be malleable enough to conform to your needs and to speak the same language as you and your staff. Many of the databases available allow users to define their own data fields and to provide customized lists of response options for each item being tracked. Some databases have multi-lingual capability so that work orders can be generated in one language, handled in the field in another, and managed back in the office in the original or a different language.

3. Compatibility with your existing data systems. Many operations have existing payroll or accounting systems, grower systems, winery databases or chemical tracking databases. How many of the existing packages are to be replaced and how many are to remain in place? If they are to remain in place, can the new database "talk with" the existing systems? In other words, how much effort will be required to link data between the new and existing systems? Is the vendor willing to work with you to develop seamless linkages from its product into the other products? Many of these companies will be happy to adapt their databases to your systems. But their time and effort must be compensated, so expect to pay for customization. Another concept is the "federated data system" in which the goal is to replace all of the smaller systems with one unified system. Some of the current offerings do more or less towards this model.

4. The maturity of the company and the product being offered. Is this an established company or a new entry in the market? If it is new, has the developer been involved with the grape and wine industry for very long? You don't want to buy or license a software product only to lose support or any possibility of upgrades one or two years later. This is less of a risk if the newer application was developed by industry and technology veterans, who have a new product but aren't likely to be going anywhere. Also, find out if the database may be easily transferred to another platform if another software package is purchased some years later or if your company merges with another company.

5. Is it software or vaporware? Be sure to have a live demo of the product performed for you or provided for you to try out. A PowerPoint presentation or nice website might look dazzling and enticing with loads of features but could be representing what is currently being developed and not necessarily the currently available software release. Make sure that you are buying functional software and not a partially completed product. All good software packages will be continually upgraded, so it is reasonable to expect some features to be "in development," but be sure that the delivered product will serve your needs right away and that the "in development" features will not be draining you of additional cash. Most of the vendors listed in this review provided me with a live demo, and for those that did not, I am quite certain that there is actual working software for sale.

6. Expect to pay a price for these applications. The era of software piracy is mostly over (in the U.S.), and companies require licensing for their products. The license requirements cannot easily be outsmarted nor should they be. These companies put significant investments into their products and deserve to be compensated for their time and expertise. Don't expect to pay the same price for this highly specialized software as you would for your word processing application. Without the mass-market volume of a spreadsheet application, your costs will probably be at least in the four digits and often more. Most, but not all, of these systems have scalable pricing structures based on acres. Because of that, it is not easy to represent the costs in this report, though some ranges are shown if the vendor provided them. Fixed-price applications will not have appeal to smaller growers but will be quite cost-effective for larger ones. Most of these applications have annual licensing fees. Again, this is reasonable. These applications are continuously evolving, and annual fees support their growth.

Product Review: Vineyard Management Support Software

Software	What sets them apart?	Pricing structure (most will require specific quotes)	Stand-alone or server-based platform
ADVISOR Agronomy System Crop Data Management Systems Marysville, CA 800-237-2367 www.cdmsadvisor.com	Includes all aspects of farming, from mapping, crop protection, irrigation and harvest. Continuously updated with current crop protection materials information. Data export to variable-rate equipment.	Fixed price; not acreage-based. Annual licensing fee.	Web server-based.
AgCode Agcode, Inc. Glenwood, MN 877-250-8435 www.agcode.com	Robust labor and resource management functionality. Unique pay rule engine; embedded labor regulations. Quick and easy data entry and large set of reporting.	Pricing is based on acreage and/or number of field personnel. Licensing fee with annual software/services fees.	Web server-based. Can be centralized (over the web) or stand-alone (private) database.
AgriScan ios, Inc. South Cle Elum, WA 509-674-7086 www.iosincorporated.com	Strong payroll functionality built in, including printing of paychecks. Easy-to-use software.	Fixed price. \$6,000 and higher for a turnkey system	Local (private) network or stand-alone.
CropTrak Enterprise Edition ScanControl, Inc. Pleasanton, CA 925-249-9463 www.scancontrol.com	Value premium over other systems. Strong viticultural monitoring tools and labor/resource management. Graphical presentation of real-time data in maps.	Per-user structure. Deployment fees and monthly server fees. Modular structure has pricing for individual report types.	Stand-alone database software with web-accessed data server used to synchronize PDAs with desktop.
Meristem Technologies Meristem Technologies Sonoma, CA 707-931-4720 www.meristemtech.com	Web-based for use by any browser—no software to install. Hand-held data collectors do not require real-time connectivity. Mapping functionality built-in. Real-time graphical presentation of data through online map/data portal.	Set-up and implementation fees. Annual acre-based subscription fee. All-inclusive, non-acreage-based fee also available.	Web server-based. Software application is accessed through a web browser.
PAM UltraVit Fairport Farm Software Spindale, NC 828-505-5111 www.fairport.com	Product has been in development for longer than most of its competition. Very detailed operations tracking and very extensive list (over 500) of customizable reports. Budgeting and economic analysis is well-developed.	Annual license and support fee. Per-user based from \$750.	Server or desktop-based. Server can run locally (private) or hosted by Fairport.
PhytoTrak Series PhytoTrak Development Company Arroyo Grande, CA 805-489-0855	Very specialized software for labor and other cost tracking. Very applicable to labor contractors. Materials tracking, pesticide-use reporting and materials inventory are built in.	\$6,000 and up, depending upon configuration and equipment requirements.	Local (private) server-based.
PremiereVision Premiere Viticultural Services Napa, CA 707-927-5180 www.premierevit.com	Designed by vineyard professionals for ultra-premium winegrowers. Web-based so improvements are made for all users. Unlimited users are accommodated due to its web-only interface. Wine quality tracking is integrated.	Fees are acreage-based. Several levels of functionality are offered. One-time setup fee is required followed by annual per-acre maintenance fees. See website for explicit pricing.	Web server-based. Software application is accessed through a web browser.
SmartHort Neal Carter and Associates Ltd. Summerland, B.C. Canada www.farmsolutions.net	Multiple types of labor tracking and payment. Tracks production from "field to fork." Wireless, instant production/sales/inventory tracking.	Ranges between \$1,000 and \$7,500 for software only.	Stand-alone database with private server.
SureHarvest SureHarvest Soquel, CA 831-477-7797 www.sureharvest.com	Excellent viticultural support, including full tracking of laboratory data. System can be customized by the user to suit their needs. Extensive reporting capabilities, with over 250 user-configurable reports available.	Choice between annual subscription fees or standard license. Per-acre pricing with volume discounts. Modular software, priced per module.	Local (private) server, but with stand-alone functionality for disconnected operability.
Tiger Jill/PET Tiger Orange Enterprises, Inc. Fresno, CA 559-229-2195 www.tigerjill.com	Truly the "granddaddy" of agricultural data systems. Over 26 years of development. Extensive labor tracking and time tracking abilities using multiple input devices. New yield estimation capability.	Modular structure for software and for pricing. User need purchase only the modules that are desired.	Stand-alone database or may be operated over a network for multiple users. Web data access is possible using only a browser.
Vitsmarter.com Grow Smarter, Inc. Highland Park, IL www.grow-smarter.com	A very simple to use data system for generating and tracking work orders. Map functionality for reference and data access. Suited to smaller growers.	Free	Web server-based.

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Software	User-configurable data fields?	Smallest vineyard unit tracked	PDA utility?	GPS compatible?
ADVISOR Agronomy System Crop Data Management Systems Marysville, CA 800-237-2367 www.cdmsadvisor.com	Yes, fully configurable.	Block level but can include vine and/or row designations.	Yes, Windows Mobile 6.0 or greater. Android OS will be supported in 2012.	Yes
AgCode Agcode, Inc. Glenwood, MN 877-250-8435 www.agcode.com	Yes, many of the data fields use user-definable lists.	Sub-block, but smaller units, such as field plots, may also be used as data units.	Yes. The PDA database is synchronized with the central database using LAN-based or cellular technologies.	Yes
AgriScan Ios, Inc. South Cle Elum, WA 509-674-7086 www.iosincorporated.com	Yes	Block or sub-block, or even rows.	PDA, synched with database.	No
CropTrak Enterprise Edition ScanControl, Inc. Pleasanton, CA 925-249-9463 www.scancontrol.com	Yes, all data fields may be changed or added to. Pre-defined responses may be customized.	Sub-block and row.	Yes. The PDA is operated as a stand-alone database application and is synchronized with the central database, using a wireless connection or a direct network or computer connection.	Yes. PDA data entry may include a GPS tag for observations.
Meristem Technologies Meristem Technologies Sonoma, CA 707-931-4720 www.meristemtech.com	Yes, all data fields may be changed or added to. Pre-defined responses may be customized.	Sub-block, which can be any size unit.	Yes, the PDA is used for field scouting, labor data entry and is synchronized with the central database over any wired or wireless Internet connection. Tablet-based devices may access web-server directly.	Yes, the application features a strong mapping feature, allowing users to map point, line and polygon features in the field.
PAM UltraVit Fairport Farm Software Spindale, NC 828-505-5111 www.fairport.com	Yes, data fields are highly user-configurable.	Sub-block. Smaller units may also be defined, such as research plots.	Pocket PAM is their PDA software, which is integrated with PAM UltraVit.	Yes, PDA mapping system is GPS-compatible. Navigation capability is included with application.
PhytoTrak Series PhytoTrak Development Company Arroyo Grande, CA 805-489-0855	Yes, limited.	Subdivision, which can be any size.	Yes, data collection may be on a PDA.	No
PremiereVision Premiere Viticultural Services Napa, CA 707-927-5180 www.premierevit.com	Data fields not re-configurable, but drop-down lists are user-configurable.	Sub-block level.	The application is accessible through an Internet-enabled PDA or tablet-based device.	No
SmartHort Neal Carter and Associates Ltd. Summerland, B.C. Canada www.farmsolutions.net	Yes, data fields are user-configurable.	Sub-block.	Yes, the PDA is a data collection tool for the main database.	No
SureHarvest SureHarvest Soquel, CA 831-477-7797 www.sureharvest.com	Yes, most data fields and drop-down lists are user-configurable.	Sub-block, but smaller units are possible, down to the vine level.	Yes, PDA or other mobile device is operated as a stand-alone application and is synchronized with the central database using a wireless or direct computer or network connection.	Yes
Tiger Jill/PET Tiger Orange Enterprises, Inc. Fresno, CA 559-229-2195 www.tigerjill.com	Many fields are configurable by the user. Multi-lingual support is provided across users.	Sub-blocks; any user-defined unit may be tracked.	Both PET Tiger and Tiger Jill will work on a Windows-based PDA or smartphone.	Yes
Vitsmarter.com Grow Smarter, Inc. Highland Park, IL www.grow-smarter.com	Yes	Block	No PDA utility. Web access via mobile devices.	No

Software Features and Functionality to Consider

When reviewing the available products, I inquired specifically about particular functionality from each product. Some or all of these questions may be of interest to you when shopping around so use this as a starting point when comparing systems for your operation:

- **Is it a stand-alone or a modular product?** Modular products allow for additional functionality to be added to a base package for an additional cost. Oftentimes, all functionality is present but needs to be switched on with a licensing code. On the one hand, it allows a user to start using the software at a lower cost. But it also means that additional costs are involved as more features are desired.
- **Does the application have a PDA (hand-held) interface and utility?** PDAs are being used extensively in the vineyard for time tracking of personnel as well as for viticultural monitoring and other data gathering in the field. Does the PDA application have GPS compatibility (i.e., can a field observation be tied to a specific location)? Tablet computers, such as the iPad, are increasingly being used. What are the capabilities of the application to run on tablets? Are other data entry methods important to you, such as bar-code scanners, biometrics (e.g., palm scanners) or RFID chips?
- **Is the database located on a remote server or is it located on the company's intranet?** If the server is remote and access is through the Internet, make sure that there are adequate security safeguards, such as tamper prevention, hacking prevention, data backup, data encryption, database privacy protection and server speed and reliability. Does the application provide for off-line use when server access is not available?
- **Does the database have user-configurable data fields?** This is an important feature since everyone uses different terminology, and a business does not want to be “trained” by the software. The software application should conform to your business.
- **What is the smallest vineyard unit that can be tracked** (i.e., block, sub-block or vine row)? Most costs are tracked to the block level, but there may be viticultural or business reasons to split the block into smaller units, such as irrigation sets, experimental plots, or weak and strong regions.
- **What labor and asset tracking and payroll functions does the application have?** This seems to be the area that most applications have improved upon during the last five years. With regulations becoming stricter and documentation becoming the norm, these applications can help growers adhere to labor laws. Just as important is cost tracking, not only for labor but also for assets, such as tractors, implements, vehicles and materials. Knowing the costs of production and weighing against revenue, businesses can identify areas of weakness so that changes can be made. Does the software provide for work orders to be generated and used as the basis for assigning labor to tasks and farming units? Payroll functionality may not be required of these systems, but the ability to interface with third party systems will save much time and effort and substantially reduce key entry errors.
- **What materials tracking and reporting features does the application have?** Application of pesticides must be tracked in any farming operation and reported to appropriate authorities. These farming applications should be able to support that process. Furthermore, you may want the software to support re-entry and pre-harvest intervals, tank mixing instructions and inventory control.
- **What farm planning capabilities are there**, including development of a calendar of operations and annual budgets per block or per ranch?
- **What economic analyses are available** (e.g., budget variance, profit/loss, return on investment capital)?
- **What vineyard scouting and monitoring functions are there** (e.g., pests, diseases, nutrition, water status, phenology, yield prediction components, fruit maturity)? This used to be the focus of most vineyard data systems as many have embellished their labor and cost accounting functions in recent years. Nevertheless, viticulture is the nuts and bolts of growing grapes, so this function should not be short-changed. It is not only important to have the ability to log these observations and measurements, but also to consolidate and represent the data in a format that is digestible and meaningful, not only to vineyard personnel but to winery personnel as well.
- **Is there an irrigation scheduling utility?** Personally, I don't rely on evapotranspiration any longer, but some people do find it useful. If it is useful to you, consider having your data system support it. Can it read external weather station data to help you schedule irrigations?
- **Are there any “expert system” functions, such as forecasting models or diagnostic utilities?** There is quite a bit of confusion about what an expert system is, but it is essentially a set of algorithms or rules that take raw data and produce recommendations for support of decision-making—for instance, fertilizer recommendations based on tissue and soil sample inputs. There are not many of these, and it may be better to call your consultant for some of the complex decision-making. Nevertheless, this functionality will continue to improve, and some real decision-making is sure to arise out of diligent data collection and results comparisons.
- **Are there Geographical Information System (GIS) functions** (i.e., mapping, rendering of color-coded maps to indicate data values, overlaying of aerial images, etc.)? It is often more intuitive to view data graphically, not only using charts but using base maps of vineyards as a tool for visualization of data as well as for interactivity with the database. A picture can really be worth a thousand (or more) words. Is there a way for external users to view some of the data, such as winery customers viewing maturity data? Additionally, does the data system have a way for maps to be made in the field, such as creating points, lines and polygons (boundaries) of vineyard features?
- **Tracking of samples (e.g., petiole, soil, fruit) from the vineyard to the laboratory and linking the analytical results to the sampled block and/or location.** This is an important feature as it allows one to view trends in nutrient status over time. Can the database read files produced by agricultural and/or winery labs? This feature will save steps in data handling and reduce the possibility for error.
- **Does the application facilitate tracking of harvested fruit from vineyard to winery (and traceability back to the vineyard)?** This may be necessary some time in the near future, but it is also a way for wineries to identify their favorite vineyard blocks.
- **What kind of reports may be generated (tabular and graphical)?** This is an important part of a data system as it is the reward for all of the data collection efforts. Are reports configurable so that specific vineyards, blocks, varieties, date ranges, etc. may be chosen by the user on the fly? An application may have too few reports available or so many that they are difficult to sort through. Choose what you think you would need—more is not always better unless you think it is.
- **What data export is available?** Data must not be locked up inside your database. Sometimes, one needs to analyze subsets of data or pass it to other software packages, such as spreadsheets, payroll systems, winery databases and GIS.

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Software	Labor tracking and payroll	Chemical application and reporting	Farm planning and tracking
ADVISOR Agronomy System Crop Data Management Systems Marysville, CA 800-237-2367 www.cdmsadvisor.com	No	Yes, this is a particular strength of the application.	Yes, with work order level management.
AgCode Agcode, Inc. Glenwood, MN 877-250-8435 www.agcode.com	Very strong labor tracking module. Hourly or piece rate data may be entered for individual or field crew. Can program "pay rules" for overtime and premium pay. Will interface with commercial payroll systems.	Tracks chemical applications as they are entered as records in the system and/or in the farm planning process. Pesticide use reports.	Farm planning, including scheduling of all activities for a season. Planning also develops budgets for each vineyard unit.
AgriScan Ios, Inc. South Cle Elum, WA 509-674-7086 www.iosincorporated.com	Yes, this is the primary function of this application.	No	No
CropTrak Enterprise Edition ScanControl, Inc. Pleasanton, CA 925-249-9463 www.scancontrol.com	Field work orders, timesheets and other time-entry methods. Crew-based and individual tracking. Payroll is accomplished using an integration with external systems.	Yes. Pesticide use reporting.	May be accomplished using work order features but not true farm plan.
Meristem Technologies Meristem Technologies Sonoma, CA 707-931-4720 www.meristemtech.com	Field work orders, timesheets and other time-entry methods. Crew-based and individual tracking. Payroll is accomplished using an integration with external systems, such as Quickbooks and Famous.	Material types and quantities may be entered into the system. Reporting features are in development.	May be accomplished using work order features but not true farm plan.
PAM UltraVit Fairport Farm Software Spindale, NC 828-505-5111 www.fairport.com	Field work orders and timesheet functions are included. Payroll systems are not in the application, but there is the ability to link to external payroll systems.	Chemical database is integrated into the application. An optional subscription is available to keep a current chemical database. Re-entry intervals, etc. are integrated, and reports may be generated.	Farm planning and tracking are functions of the software.
PhytoTrak Series PhytoTrak Development Company Arroyo Grande, CA 805-489-0855	Labor tracking is the primary purpose of this application.	Yes, chemical applications, inventory and pesticide-use reporting are built in.	Work orders but not detailed farm planning outside of budgeting.
PremiereVision Premiere Viticultural Services Napa, CA 707-927-5180 www.premierevit.com	Man-hours tracking per task but not per employee.	Work order-based planning and tracking, including products needed for applications. Prepares pesticide use reports.	Very strong farm planning and tracking tool, which is the core of the system. Prepares Gantt charts for task tracking.
SmartHort Neal Carter and Associates Ltd. Summerland, B.C. Canada www.farmsolutions.net	Numerous ways to track labor. Does provide payroll functionality but not direct interactivity with other payroll software. It can output text files for import by 3rd party payroll applications.	Yes, chemicals are tracked to each block.	No
SureHarvest SureHarvest Soquel, CA 831-477-7797 www.sureharvest.com	Full labor tracking, per PhytoTrack module. Exports payroll data to third-party payroll applications.	Work order scheduling and tracking. Incorporates timing of materials into facilitating workflow schedules. Pesticide use reporting supports electronic submission.	Yes, including budget development and document management.
Tiger Jill/PET Tiger Orange Enterprises, Inc. Fresno, CA 559-229-2195 www.tigerjill.com	PET Tiger is the company's payroll employee tracking and management application. Full labor tracking functionality. Input time sheet data with a wide variety of interface devices. Interfaces with any third party payroll application.	Tracks chemical applications as they are entered as records in the system. Generates county, state and federal use reports. Inventory tracking and worker protection standards posting.	Tracks all aspects of farming operations but is not a strong farm plan generation tool.
Vitsmarter.com Grow Smarter, Inc. Highland Park, IL www.grow-smarter.com	Yes	No	Yes, through a series of work orders.

Software Descriptions

ADVISOR Agronomy System

This system is from **CDMS** (Crop Data Management Systems). The **ADVISOR** has been quite well developed and should remain one of the major players in the field. It includes all aspects of farming, mapping, crop protection, irrigation and harvest. The system is continually updated with current crop protection (i.e., pesticides) information, which will keep users current. The system is web-based and is highly configurable. The system has full support for nutrient sampling and integration with variable rate application machinery, which is a unique feature. Based on a federated data model, the goal of this product is to eliminate the need for multiple data systems, its system serving as the go-to utility for business management.

AgCode

AgCode is built strongly around labor and resource management, which was its primary initial purpose. A unique pay rule engine handles numerous permutations of labor payment, with detailed tracking of equipment usage and costs. Labor regulations are embedded into the product to aid users in compliance. Farm planning, including budgeting and cost tracking against budget, is a strong feature of this product. Vineyard monitoring features are a more recent addition but are also robust. Data entry is quick and easy, and the software features a large set of built-in reports. The system is web-based.

AgriScan

This tool is a labor and payroll system and does not have viticultural monitoring features. That said, it does the labor and payroll functions quite well. Allowing for a large set of input devices, labor clock-in and clock-out processes are easily facilitated. Barcode scanning may be used if desired. This system will interface with a number of existing payroll applications but may also be used to process payroll, including check printing, itself. This is a private server or stand-alone application.

CropTrak Enterprise Edition

The **CropTrak** system is offered by **ScanControl**. Basic users will find this a value premium over other tools as the entry price is relatively low. More advanced or larger enterprises will want to tap into the web portal features of the system, where data may be viewed in tabular reports or through custom maps. Viticultural monitoring tools are quite strong in this system as it was the product's initial strength. More recently, the company has added extensive labor tracking functionality to the product. The system is highly configurable, especially with regard to its vineyard monitoring functions. It is based around a client-server architecture, with data synchronized between desktop and mobile units with a centralized web-based server. The online data portal is web-based.

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Software	Resource (equipment) management	Vineyard economics and budgeting	Vineyard scouting	Irrigation scheduling	
ADVISOR Agronomy System Crop Data Management Systems Marysville, CA 800-237-2367 www.cdmsadvisor.com	Yes	Yes	Yes	Yes	
AgCode Agcode, Inc. Glenwood, MN 877-250-8435 www.agcode.com	Very detailed tracking and documentation of equipment and resources used for tasks. Costs are assigned to equipment for budget tracking.	Detailed costs are tracked for personnel, equipment and materials. Both employee and contract labor may be tracked. Farm planning includes budgeting tools.	Any user-definable scouting parameter may be addressed.	Yes. ET-based irrigation schedules.	
AgriScan Ios, Inc. South Cle Elum, WA 509-674-7086 www.iosincorporated.com	Yes, equipment can be assigned to crews	Not directly but reports can be built using external data access.	No	No	
CropTrak Enterprise Edition ScanControl, Inc. Pleasanton, CA 925-249-9463 www.scancontrol.com	Yes, equipment may be assigned to jobs and workers and its usage tracked.	Costs are tracked at a block level, and vineyard return on investment can be determined.	Any user-definable scouting parameter may be addressed. Photos may be attached to scouting records.	Yes, through work orders.	
Meristem Technologies Meristem Technologies Sonoma, CA 707-931-4720 www.meristemtech.com	Yes	Costs may be entered into system.	Any user-definable scouting parameter may be set up for tracking.	Yes, through work orders.	
PAM UltraVit Fairport Farm Software Spindale, NC 828-505-5111 www.fairport.com	Yes, records equipment usage as it is being used for tasks.	All operating costs and income are tracked. General overhead costs may be allocated across vineyard blocks.	Any user-definable scouting parameter may be addressed.	Yes, through work orders. There are models for irrigation and soil moisture also.	
PhytoTrak Series PhytoTrak Development Company Arroyo Grande, CA 805-489-0855	Yes, equipment costs are tracked.	Yes, there is a budgeting module that can be used, along with actual costs, and exported into a spreadsheet to track variances.	No	No	
PremiereVision Premiere Viticultural Services Napa, CA 707-927-5180 www.premierevit.com	Yes, with user-defined fields.	Farm plan provides a budgeting tool, and costs per task may be entered to track against budget.	Pests, water status, yield components, etc. may be tracked. Alerts may be programmed based on defined thresholds.	Weather station data inputs to drive ET-based irrigation scheduling.	
SmartHort Neal Carter and Associates Ltd. Summerland, B.C. Canada www.farmsolutions.net	May be tracked but no costs are associated.	No	Yes, there is a module for scouting.	No	
SureHarvest SureHarvest Soquel, CA 831-477-7797 www.sureharvest.com	Can track equipment usage and associated costs as well as maintenance scheduling.	Cost tracking and revenue reporting are all supported. Ability for farming management companies to invoice their customers based on inputs.	Any user-definable scouting parameter may be set up for tracking.	Work orders for irrigation scheduling. Data entry for irrigation tracking using handhelds.	
Tiger Jill/PET Tiger Orange Enterprises, Inc. Fresno, CA 559-229-2195 www.tigerjill.com	Can track equipment usage and associated costs, including maintenance records. Equipment may be tied to individual operators or farming units.	Maintains a detailed budget for each managed unit. Can be used to create budgets and track deviations from budget. Will prepare a profit and loss report.	Tiger Jill may be used for field scouting of numerous parameters. Photos may be attached to scouting records, as well as GPS tags.	Tracks applied irrigation as well as inputs required for irrigation (e.g., energy pumping volumes, etc.).	
Vitsmarter.com Grow Smarter, Inc. Highland Park, IL www.grow-smarter.com	No	No	No	Through work orders, but no decision-support.	

Tracking of phenology, yield components, fruit maturity etc.	Decision support / expert Systems
Yes	Yes
Yes, parameters may be tracked in the field. Harvest date estimates and yield estimates are computed using phenology and yield component data entry.	Harvest date and yield prediction.
No	No
Yes, any user-definable parameter may be set up for tracking.	Reporting features allow for some decision-support.
Yes, tracking and reporting of phenology, maturity and yield estimation are included.	Reporting features allow for some decision-support. Phenology and yield estimation reports.
Yes, tracking and reporting of phenology, maturity and yield estimation are included.	Yes, vine growth models and irrigation scheduling. Yield estimation.
No	No
Yes, these may be tracked. Phenology-based harvest date prediction is a feature of the software.	Harvest prediction functionality. Alerts can be defined.
No	No
Parameters may be tracked in the field. Yield estimates can be generated using any number of user-defined formulas. Formulas for other computations can be entered as well.	Not explicitly, but through reporting.
Yes, parameters may be tracked in the field. Newly-developed yield estimation and reporting functionality.	Not a true expert system. Reports, such as yield estimation, can be used to support decisions.
No	No

Meristem Technologies

The **Meristem** product brings map-based data representation as its strong point. The system operates through a web-based data portal, where data may be viewed through a set of pre-defined reports or via a map interface. The map interface includes background aerial imagery and renders data in real-time based on user-definable parameters. This can be a useful feature when monitoring vineyards for maturity, for instance, as winery customers can easily log in to see block maturities at a glance. A PDA interface allows for field data collection, or users may enter data via the web with web-enabled devices, including tablets. PDA devices may be synchronized with the parent database using any Internet connection. The portable system also allows users to create GPS maps of features, such as block boundaries, irrigation valve locations, roads, etc., using a mapping tool.

PAM UltraVit

The **PAM UltraVit** application, from **Fairport Farm Software**, was developed initially as PAM AusVit. Modified for use outside of Australia, the PAM UltraVit application appears to be a mature, full-featured product. The product has very detailed operations tracking capability and a huge list of pre-defined and customizable reports. The PAM UltraVit's budgeting tools and economic analysis tools are well-developed. The product also offers multi-language support, allowing multiple users to use the same system with different language menus. This product can be configured using a data server or can be desktop-based for smaller operations.

PhytoTrak Series

This system is specialized for labor and other cost tracking. While it does not have viticultural monitoring capability, it does have materials tracking and performs pesticide use reporting. Inventory tracking is also included. The application is useful for labor contractors as well as vineyard operations as support for billing clients is built into the software.

PremiereVision

Many improvements have been made to this product since its review in 2006. The product continues to be focused around viticulture and is the only one that includes wine tasting notes linked to vineyard blocks. The system is web-based and requires access to the Internet for data entry. There is no separate field application. However, the product is quite configurable and has the ability to create email or SMS alarms based on data thresholds, which is something the other applications do not offer. Vineyard plans may be created in a Gantt chart representation, and actual operations may be compared against the plan. Extensive reporting and export features appear throughout the menu structure.

Product Review: Vineyard Management Support Software

Software	GIS and mapping	Laboratory sample tracking	Traceability to/from wine lots	Report generation	
ADVISOR Agronomy System Crop Data Management Systems Marysville, CA 800-237-2367 www.cdmsadvisor.com	Yes. Variable-rate applicator integration.	Yes	Yes, integrates with other applications.	Long list of available reports.	
AgCode Agcode, Inc. Glenwood, MN 877-250-8435 www.agcode.com	Data may be exported to a GIS application for data rendering on a map.	Field samples for laboratory analysis may be tracked.	Yes, links harvest data to winery lots.	Yes, many built-in reports.	
AgriScan Ios, Inc. South Cle Elum, WA 509-674-7086 www.iosincorporated.com	No	No	No	Yes, reports are available based primarily around operations costs. Other reports may be generated by the user using an external database.	
CropTrak Enterprise Edition ScanControl, Inc. Pleasanton, CA 925-249-9463 www.scancontrol.com	Enterprise edition has map-based reporting that can be used for economic analyses and other tracking.	Any user-definable parameter may be sampled and tracked. No provision for importing laboratory analytical results.	Not included in base application but company specializes in integrating its software with external applications.	User-definable reports using a report generator. GIS interface can be used to represent information with custom-built report modules.	
Meristem Technologies Meristem Technologies Sonoma, CA 707-931-4720 www.meristemtech.com	Web portal has integrated mapping functionality. Mapping-based reporting is a strength of this application.	Any user-definable parameter may be sampled and tracked. No provision for importing laboratory analytical results.	Yes, harvest load tracking functionality with alerts to vineyard and winery staff.	Excel and PDF reports are built-in. Map-based reports are also a feature of this application. Map display may be dynamic and change in real-time.	
PAM UltraVit Fairport Farm Software Spindale, NC 828-505-5111 www.fairport.com	Fully-featured GIS. Thematic maps and data entry via maps.	Samples may be tracked from the vineyard to the laboratory, and data from the laboratory may be imported into the database for evaluation.	A Load ID can be assigned to grape deliveries for tracking with an external winery database.	There are about 440 built-in reports where data may be filtered to focus results. Text and map-based reports.	
PhytoTrak Series PhytoTrak Development Company Arroyo Grande, CA 805-489-0855	No	No	No	Over 80 reports may be generated. Filters to select specific information.	
PremiereVision Premiere Viticultural Services Napa, CA 707-927-5180 www.premierevit.com	GIS images can be included, but GIS functionality is not part of the system yet but is in development.	Samples may be tracked from the vineyard to the laboratory, and data from the laboratory may be imported into the database for evaluation.	Yes, interfaces to other winery database applications. Records wine tasting notes linked to vineyard blocks.	PDF reports are found extensively throughout the application. Numerous reports are available.	
SmartHort Neal Carter and Associates Ltd. Summerland, B.C. Canada www.farmsolutions.net	No	No	Yes, barcode-based tracking codes.	Yes, several reports are available.	
SureHarvest SureHarvest Soquel, CA 831-477-7797 www.sureharvest.com	Some GIS functionality	Sample tracking to the laboratory may be performed along with tracking of laboratory results.	Supports tracking from vineyard to associated winery tracking numbers, including steps in-between.	Over 250 user-configurable reports, with tabular, summation and graphical output.	
Tiger Jill/PET Tiger Orange Enterprises, Inc. Fresno, CA 559-229-2195 www.tigerjill.com	Tiger Jill will import maps to use in the work orders or pest control recommendations.	Sample tracking to and from the laboratory may be performed.	Harvests from field may be tracked up to the point of delivery.	There are hundreds of built-in reports, and there are user-customizable reports also.	
Vitsmarter.com Grow Smarter, Inc. Highland Park, IL www.grow-smarter.com	No, but does have an interactive "live" aerial image-based map.	No	No	PDF reports and work orders.	

Data export	Strengths
Yes, in XML format.	Federated data system, which eliminates the need for multiple data storage and retrieval solutions. Built-in access to CDMS materials database. Strong pesticide tracking and variable-rate applications support.
Reports export to PDF, Word, Excel and TXT files.	Vineyard farm planning, budgeting and cost tracking are the strengths of this application. Labor tracking and payroll functionalities are strong.
Yes, Word, Excel, MS Access, HTMS and XML formats.	An easy-to-use database intended for labor and asset management and cost-tracking. Interfaces with a wide array of input devices.
Yes, Excel, comma-separated and PDF. External Access is available for data manipulation.	Low cost per unit makes it a good solution for small to large operations. Easy-to-use and configure. Enterprise solution creates custom web portal with map-based data representation.
Yes, Excel, comma-separated variables and PDF.	Strong mapping feature, not seen in other database applications. Real-time map-based information portal will be of use to vineyard operators as well as wineries at harvest. Rapid and easy data synchronization from field.
Text: PDF, Excel, Comma-separated, HTML, Word, JPEG. Mapping: Shapefile, Google Earth KML, DXF and others.	Simultaneous multi-language support. Strong mapping and reporting ability. Very clean interface. The length of time under development shows as a highly-polished product. Recently made available in the U.S.
Yes, Excel, MDB database files, PDF and text files.	This is a strong labor and cost-tracking application that has been around for 16 years. Product has been incorporated into SureHarvest system to provide full viticultural support.
PDF, Excel and text messaging.	This system has improved since the last review. Extensive interactivity with alarms is a very nice feature. This database is very viticulturally-focused, and the emphasis is on high-quality wine production.
Yes, but only some reports and all barcoding fields.	This system's strength is in the full-featured labor tracking and payroll functionality.
PDF, Word, Excel or comma-separated variables data output.	A complete package that includes strong labor and asset tracking, viticultural monitoring with a vast array of configurable reports. Software has a professional look and feel to it.
PDF, Excel and text file output.	The longevity of the company attests to its strength in this market. The product is highly modularized. Efficient "drill down" access of high level data down to details. Yield estimation and labor/asset modules are particular strengths.
No	This system removes all growers, especially smaller ones, of any excuse to not use a data system for work order tracking. Cost-free system, yet professional look and feel.

SmartHort

This product is not specifically designed for vineyards, but for general horticultural operations, including tree and vine crops. The system is based around labor tracking and payment. As the company states, production is tracked "from field to fork." In this case, field to winery. This system includes a full-featured payroll function.

SureHarvest

SureHarvest has added **PhytoTrak** as a module to its application, adding much-needed labor, asset and materials tracking to its strong viticultural monitoring functionality. The application has a very polished look to it. It features a long list of reports, which are customizable per the user. The application provides full tracking of laboratory data, which is an important feature for viticulturists as it allows for tracking of nutrients, etc. over a number of years.

Tiger Jill/PET Tiger

The developer, **Orange Enterprises**, has been in business for over 26 years now, so this application was truly ahead of its time. Continuously evolving since then, the product is highly modularized so that individual packages of features may be added based on the needs of the client. The product now includes a robust yield estimation function, which facilitates sampling, computations and reporting of estimated yield. The **PET Tiger** product supplies the payroll and employee tracking functions of the product, and is quite robust on its own or along with **Tiger Jill**. The software uses a desktop-based interface, operated either stand-alone or via a local network. A portable PDA application is used for field data collection. Numerous time sheet and employee input devices are supported in **PET Tiger**.

Vitsmarter.com

Vitsmarter is a simple and free web-based application for the creation and tracking of vineyard work orders. The application may be configured with employees, crews and vineyard blocks, and the vineyard blocks may be displayed as icons on a built-in aerial image. This program does not try to incorporate all of the cost tracking that other data systems do but is a very useful product for smaller growers not ready to invest in a dedicated database yet who wish to track their vineyard operations. **WBM**