

Published by Washington Wine Industry Foundation:

http://www.washingtonwinefoundation.org./index.php?page_id=12&newsletter_id=32



University of Washington students researched the viability of using satellite imagery to map tree fruit and grape crops each year.
L-R: Steve Cudd, Joan Johnson, Carlito Tolentino

UW Students Research Satellite Imagery to Map Northwest Tree Fruit and Grapes

Jul 31, 2006

Student research determines using satellite imagery and software combination may help the industries easily map crops each year

Cashmere, WA – A team of University of Washington (UW) students, working with the Washington Wine Industry Foundation (WWIF), recently researched the viability of using satellite remote sensing technology combined with processing software to map northwest grape and tree fruit crops yearly, to provide growers with timely information on which to base their decisions.

Students Joan Johnson, Steve Cudd and Carlito Tolentino from the UW Extension geographic information systems certificate program- part of UW Educational Outreach, the continuing education branch of the University of Washington in Seattle - completed the research in June, with results indicating positive potential for the imagery and software combination to map crops, though the results are not yet conclusive. More study must be done to fully verify the future of the technology.

The project was designed to evaluate commercial satellite imagery combined with processing software to develop detailed digital maps for acreage surveys, and a geodatabase with information on acreage by crop and variety that can be easily updated by the industry.

The team focused their research on one geographic area in Chelan County, 28 square kilometers between the cities of Chelan and Manson, due to the amount of crop data already available, particularly from ground truthing, to verify results.

The team researched the types of data already available to map crops to assess detail level and cost. "Commercial satellite remote sensing technology provides the level of detail needed, 60cm resolution, which easily differentiates crops, but it requires more analysis to determine the cost effectiveness," explained Joan Johnson, group project manager.

The team evaluated the viability of the technology using one 60cm, multi-spectral QuickBird satellite image purchased from DigitalGlobe, a satellite imagery vendor. Then, using the processing software, Feature Analyst and ArcGIS, layered known crop data from WSDA onto the image to train the software to recognize different crops and varieties. Once the software recognized the different crops and varieties, it was used on image areas without known data to categorize the crops.

“Discovering if we could train the software to distinguish between crops was very important.” said Carlito Tolentino, team member. “Otherwise, the software might categorize apples and cherries or table grapes and wine grapes as the same crop. The point of the technology is to streamline the process of gathering data on the crops, so growers no longer have to spend their time filling out survey paperwork.”

Currently Washington state crop maps are generated mainly by fee-based ground and paper surveys, taking at least three years to update. A survey of tree fruit and grape acreage is in progress this year with results due in February 2007.

“We’re pleased with the UW students’ research results,” said Vicky Scharlau, executive director of WWIF. “With northwest tree fruit and grape industries changing rapidly, growers need accurate crop information every year – without spending their time and energy filling out forms. Utilizing satellite imagery with unique software gives us the ability to make better business decisions in a timelier basis.

For more information about the UW student team’s research results, visit www.washingtonwinefoundation.org

The students’ research is for a partnership grant between the Washington Wine Industry Foundation and the United States Department of Agriculture (USDA) Federal Crop Insurance Corporation (FCIC), through the Risk Management Agency (RMA) titled: Grower Decision-Making Tools for Grapes and Tree Fruit. The grant tree fruit partner is the Washington Growers Clearing House Association. Other northwest grant collaborators include: Oregon Wine Board, Idaho Grape Growers and Wine Producers Commission, Washington Tree Fruit Research Commission, Washington State Grape Society and Washington Association of Wine Grape Growers.

The USDA awarded twelve research partnerships for a total of \$5.1 million toward the research and development of new non-insurance risk management tools. The grant submitted by the Washington Wine Industry Foundation is the largest Research and Development Agreement awarded. Funding for these agreements is made available under the Federal Crop Insurance Act provisions for risk management and implementation of research and development, community outreach and assistance, and crop insurance education in targeted states. USDA’s Risk Management Agency administers the projects.

The grant partnership will benefit the 1,000 grape producers, 700 wineries and 6 juice processors in the Pacific Northwest grape industry and the 4,000 growers and 80 warehouse processors in the tree fruit industry, encompassing apples, pears and cherries. The resulting tools will also benefit industry providers such as lenders, insurance, sales, marketing research, extension, and others.

The work is in progress now, and will be completed in stages by February 2007.

###

The Washington Wine Industry Foundation provides resources to meet the needs of the Washington wine industry. Organized in 2001 as a 501(c) (3) it seeks opportunities to administer scholarships and charitable donations, and to provide for or coordinate education, outreach and research programs. In many cases, WWIF partners with other industry organizations to fulfill these objectives. For more information, visit www.washingtonwinefoundation.org.

For more than 90 years, UW Educational Outreach has provided students from all walks of life access to high-quality programs that help them reach their professional, educational and personal goals. Last year, nearly 50,000 students participated in UW Educational Outreach supported

programs including summer quarter, certificates, degrees and English-language programs. For more information about UW Educational Outreach, please visit www.outreach.washington.edu or call 800-543-2320.

The Pacific Northwest Grape Industry consists of 1,000 grape producers, 700 wineries and 6 juice processors.

Washington State ranks second in premium wine production in the U.S. The economic impact of the Washington wine industry is \$2.93 billion annually. 400+ wineries and more than 350 growers with 30,000 acres of wine grapes produce 17 million gallons of wine a year in Washington. There are currently nine recognized AVA appellations – Yakima Valley, Walla Walla Valley, Columbia Valley, Horse Heaven Hills, Puget Sound, Red Mountain, Columbia Gorge, Wahluke Slope and Rattlesnake Hills. For more information, visit www.washingtonwine.org.

Oregon ranks fourth in wine production in the U.S., with an economic impact of more than \$1 billion annually. 300+ wineries and more than 500 growers with 13,700 acres of wine grapes planted in 40+ grape varieties produce 1.2 million cases of wine a year. There are currently eleven recognized AVA appellations – Columbia Valley, Umpqua Valley, Walla Walla Valley, Willamette Valley, Rogue Valley, Applegate Valley, Columbia Gorge, Dundee Hills, Yamhill-Carlton, Southern Oregon and McMinnville. For more information, visit www.oregonwine.org.

Idaho's long standing wine industry, started in 1864, is growing at a rapid pace with an economic impact of more than \$40 million annually. 25 wineries and more than 54 growers with 1,200+ acres of wine grapes planted in 45 grape varieties produce 200,000 cases of wine a year. The majority of Idaho vineyards are in the southwest corner near the Snake River, the first proposed Idaho AVA. For more information, visit www.idahowines.org.

Apples have been the leading revenue generating crop in Washington State for twelve of the past thirteen years. Growers generate \$905 million on 192,000 acres and approximately 4,200 farms. On average, Washington State produces 50% of the U.S. apple crop and supplies about 65% of the U.S. fresh market. Washington is also the leading producer of winter pears and the second largest producer of Bartlett pears. Together, these two categories of pears generate approximately \$121 million from just under 25,000 acres. The state is also the nation's premier producer of sweet cherries and accounts for 46% of the nation's crop. Annual production totals 106,000 tons and ranks as the State's second most important fruit crop with a value of over \$250 million. There are an estimated 2,200 cherry growers in the state. Together, these three fruit crops add approximately 53,000 jobs to the state economy annually and generate roughly \$356 million in wages for Washington workers.

Organic tree fruit production continues to grow and is valued at \$35 million and involves an estimated 200 organic growers and over 12,000 acres. For more information visit www.waclearinghouse.org.