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HOW AM I SUPPOSED TO STAY IN BUSINESS WITH THESE HIGH ENERGY PRICES?

Jim Thompson, Agricultural Engineer, UC Davis and
Steve Tjosvold, UCCE Environmental Horticulture Farm Advisor

As we are all painfully aware, oil prices have skyrocketed in the last two years. Who ever thought filling a car could cost \$100? The average US diesel price was \$2.88 per gallon in 2007 and is expected to increase 51% this year to \$4.35 per gallon. The US Department of Energy predicts diesel will cost \$4.48 per gallon in 2009. Will the high costs ever end?

Little relief is expected in the next few years. There is lots of talk about an "oil price bubble" that will burst and give us relief from the \$140 per barrel cost of crude oil. This seems likely considering it costs about \$50 per barrel to extract the most expensive oil in the world, and oil is being produced from oil shale and tar sands for \$70 per barrel. But in the short-term world, oil consumption is expected to increase and production is not expected to keep up with the demand. The bubble will not burst until production increases faster than demand.

Price predictions are better for natural gas, but only a little. The US Department of Energy predicts average residential prices will increase 16% per year for the next two years. Electricity in California will also see a 5% price increase this year and pressure in the future for additional increases.

The high cost for getting your product to the consumer is the biggest effect of expensive energy. Refrigerated highway trucks now cost \$10,000 to take a load to the Eastern US. The only quick solution to this is to pack more product in the truck and directly reduce the per plant transport cost. See the accompanying Santa Cruz and Monterey Regional Report on transportation costs for an article on what a venerable nursery stock operation is doing in England.

If you are shipping product that needs low temperature transport, do not be tempted to increase the thermostat

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EDITOR'S NOTE

In this issue we focus on ideas to help sustain your business in an environment of increasing energy costs related to heating and cooling, transportation, irrigation pumping, and fertilizer. The two feature articles on the front page provide some practical ideas to consider, including energy saving practices that growers have already implemented. Each of the four regional reports has an energy focus. One of those reports is from Colleen Warfield, the new UCCE farm advisor located in Half Moon Bay. The **Regional Reports** and **Get Cultured** from Don Merhaut draw attention to the fact that nursery businesses must be efficient in consuming energy and with other major material inputs that go into plant production. The term "sustainable" comes up frequently. Irrigation pumping costs can be significant, and new tools to help determine irrigation timing are presented in Richard Evans' article in the **Science to Grower** section.

Steve Tjosvold

GROWER PERSPECTIVE ON RISING ENERGY COSTS

Jennifer Orsi, UC Davis graduate student and Heiner Lieth, Crop Ecologist

With fuel costs rising, all segments of the ornamental plant production industry would seem to be in for higher costs. We contacted several flower and potted plant growers throughout California to get their perspectives on this topic.

Alan Mitchell of California Pajarosa, a cut rose flower nursery in Watsonville, California, had an interesting perspective regarding the energy crunch

and ways to reduce costs. High diesel and fertilizer prices are causing nursery operators to be more aware of their consumption, environmental impact, and cost and therefore more responsible with their energy usage. California Pajarosa has taken a step in that direction by obtaining their Veriflora Certificate. "It is our way of being sustainable and more aware of our environment and taking care of it," Alan says. Veriflora

is a nonprofit organization that certifies growers and handlers of cut flowers and potted plants who practice environmentally responsible management of fertilizers and pesticides and also meet high sustainability standards.

California Pajarosa has started delivering flowers to San Jose and parts of the Bay Area with their own trucks in an effort to support and increase their
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local market. The rationale is to reduce transportation costs for their customers.

The cost of some fertilizers has risen dramatically as part of the increase in the price of petroleum. For California Pajarosa, the price of Monopotassium phosphate, for example, has risen from \$1,300 a ton to \$4,000 a ton. According to Alan, he will be able to “reduce the use of that fertilizer, because our water reclamation system recycles our fertigation water, without comprising the quality of the flowers.”

For ways to save on heating costs, Alan suggests that growers who don't have glass greenhouses use double poly plastic to cover their greenhouses because it holds the heat most efficiently. He also plans to look into new Dutch computer software programs because they more efficiently control irrigation and climate in the greenhouses.

Ed Van Wingerden, of Ever-Bloom, a cut Gerbera nursery in Carpinteria, is also concerned about the rising costs of fertilizers. Ed is bracing himself for steadily increasing costs and an anticipated shortage of some materials. “I'm building up a two-year stock of fertilizer before the most expensive fertilizers like Monopotassium phosphate and potassium nitrate go through the roof,” Ed says.

When asked if he had suggestions to share with other growers with regard to energy costs, Ed said, “Make sure your greenhouse is as tight as possible.”

He also suggested routinely adjusting vents, insulating pipes, and upgrading equipment with an eye on efficiency. Recently Ed replaced his two nine-year-old boilers with one new boiler that is 97% efficient. The move already saved him 39% on energy costs in the last 12 months. Also, he took advantage of rebate offers from the Southern California Gas Company for updating equipment, insulating pipes, and installing dual shade and energy/humidity curtains. He suggests other growers take advantage of this, too.

Jim Marshall, from Suncrest Nursery, an outdoor ornamental container nursery in Watsonville, California, discussed increasing energy costs and environmentally friendly alternatives to using conventional diesel fuel. Suncrest Nursery delivers nursery products throughout California. The biggest change in energy costs for Suncrest is the increase in the price of diesel fuel. “To reduce fuel costs, we use low horsepower tractors on the farms that run on B99 biodiesel, which is primarily vegetable oil. It costs about the same or a little more than diesel, but we receive a tax credit on the use of biodie-

sel and it is healthier for our employees and the environment. In our delivery trucks we use a B20 blend of biodiesel because it is safer on the engine than B99 biodiesel,” Jim says.

Suncrest also tries to be efficient by routing deliveries along the shortest path, combining as many routes as possible, and decreasing the delivery equipment in the truck so they can handle more plants.

Jim believes that rising energy costs and the current economy will favor the regional market. “Our advantage is that we are regional and the closer you can provide service is a good thing. A regional sustainable business relationship is better especially for the agriculture and horticulture market,” he says.

In order to reduce energy costs in the future, Suncrest is replacing their current boiler for their propagation greenhouses with a new modulating condenser heating boiler. Currently, an engineer is doing a feasibility study to determine if using captive tube solar energy panels to heat the water used for warming the root zone in the propagation greenhouses will be a plausible, cost effective and environmentally friendly way to heat water. The captive tube solar panels are used to capture the sun's energy and heat water in an insulated storage tank, then the water is circulated in tubes that radiate heat in the air and root zone at nighttime. If this is a feasible way to heat water and save money on energy costs, then Suncrest will be installing in the next two years.

George Gutman from Bordier's Nursery, a wholesale woody ornamental nursery in southern California, had transportation and heating costs on his mind. Bordier's sells to customers in the continental United States and ships with their own trucks to customers in California, Nevada, and Arizona. Their clientele includes big box stores and smaller retail nurseries. Some of their customers are under contracts that were negotiated before the big surge in diesel prices, and the transportation costs are included in the landed price of the product. As a result, Bordier's is not able to raise fuel surcharges until the



Dual shade/humidity curtains reflect sunlight keeping the greenhouse cool in summer while conserving heat during winter.



Suncrest Nursery incorporates environmentally friendly alternatives into production.

contracts are renegotiated. Currently, they use a common carrier to ship their product outside of California, Nevada, and Arizona, but because of the high transportation costs they are evaluating if it would be more cost effective to ship with their trucks.

George also took advantage of rebates and promotions from the local utility companies. His energy supplier offers a lower rate for off-hour water pumping from their well. To take advantage of this, Bordier's pumps well water into a reservoir at night and uses

the reservoir water to irrigate the plants during the day. The biggest rebate Bordier's receives happens "every couple years when we replace the double poly on the greenhouses. We receive a rebate from our local utility company," George says. "These (utility) companies are trying to give the money away for specific energy saving methods and materials. It's my impression that people aren't taking advantage of them."

Perhaps one of the most compelling lessons for growers is that while everyone will be affected by higher fuel costs, local and regional production and sales will see less negative pressure than companies who have to transport product over long distances. This can make domestic cut flower growers and regionally focused nursery companies more competitive. All growers are under pressure to improve energy efficiency and those who lag behind on making adjustments or taking advantage of rebate opportunities will have a harder time being competitive in the months ahead.



High Prices - Continued from page 1

setting to cut refrigeration costs. This will only reduce the quality of your product and hurt future sales.

In the longer term, high fuel prices will force production closer to the end consumer. Jim Reiter, co-owner of Watsonville-based Driscoll Strawberries, gave a presentation on the future of agriculture at the annual Santa Cruz County farm bureau meeting in June. Regarding higher transportation costs, Jim suggested his production needed to get closer to the consumer, and that says something since he ships around the world. He implies that some present markets just might be too far away and not economical to serve. Farmers' markets or grower cooperatives have many notable successes in California. With these marketing approaches, there is a central distribution point where the producer brings the local product for sale, and usually transportation energy costs for the producer are conserved.

Energy costs for greenhouse production can be reduced by the standard approaches to conservation.

- Make sure the greenhouse and heating system are clean, well sealed, and in good repair. Checking for uniform air temperature throughout the facility is a good way to confirm this.
- Calibrate thermostats.
- Use double layer coverings.
- Make sure heat curtains are in good repair and use them.
- Select crops that grow at lower air temperatures.

A more detailed energy conservation checklist may be found at <http://www.hort.uconn.edu/ipm/greenhs/bartok/htmls/Greenhouse%20Energy%20Conservation%20Checklist.htm>

Utility rebates are available for some energy saving investments, be

sure and check with your local customer representative to find out about incentive programs. See the accompanying Santa Cruz and Monterey Regional Report on equipment rebates for offerings from Pacific Gas and Electric.

Alternative heating sources are economically feasible only under unique situations. Neighboring industrial operations may sell their waste heat at a reasonable price. Landfill operations produce methane that can be tapped for heating. Geothermal heat has been used to heat greenhouses in California, but the resource is scarce and not near traditional growing areas. Solar heating has been tried and it is not economically feasible.

California nursery operations must adapt to high energy prices. Save energy where you can. Be creative in your marketing strategy. Make more profit with the energy you must use.



GET CULTURED

REDUCING NURSERY PRODUCTION COSTS

Donald Merhaut, Extension Specialist for Nursery and Floriculture Crops

With the cost of everything going up, it is critical to reevaluate your production program to determine which expenditures can be reduced or eliminated. The following article will present some “dos and don’ts” for streamlining a nursery production system.

In order to save money, it is important to have knowledge of expenditures for the nursery. Being organized is crucial. Once you understand where your money is going, you can address the aspects of nursery production that are the costliest. One way to organize, is to break down nursery operations into sections: 1) fertilization programs – fertilizer types, methods of application and storage; 2) irrigation programs – water, recycling, types of irrigation equipment; 3) media - selection, preparation and storage; 4) pest and disease management 5) vehicle and equipment use and maintenance; 6) general cultural practices; 7) nursery infrastructure – roads, buildings and nursery design; 8) labor cost and usage; 9) waste reports – what plants are being dumped because they are dead, diseased or not being sold; 10) office supplies and overhead; and 11) marketing and advertising.

Below is a list of more general things to consider. It is important to develop a more comprehensive list specific to your nursery operations. Remember that even though some things may be less expensive, they may be more costly in the long run. The discussion of planting media is a good example of how a cheaper substrate may be more expensive due to shrinkage and additional fertilizer needs.

1. Planting Media – caution on wood chips. When selecting a new less expensive media, make sure the artificial substrates are stable. For example, wood chips and uncomposted plant residues may seem like a good deal because of their low costs, however, the wood fibers will act as a major sink

to any nitrogen that is applied. When fertilizer is added to these high carbon components, the wood chips will break down causing shrinkage of the planting mix and robbing your plants of needed nitrogen. The added costs of additional fertilizers will eliminate the savings gained in the less expensive wood chips or uncomposted plant residues.

2. Lighter Media – reducing shipping costs. Selecting a relatively lighter substrate such as perlite compared to sand or pumice may reduce shipping costs. Test production of plant material in these new components before changing the entire production program. Some substrates may be lighter, but may have some chemical differences, causing plant growth problems.

3. Coir versus Peat. The cost of coir (coconut husks) and peat are both going up. However, one product may be less than the other in a given region. High quality coir and peat are somewhat similar, except for pH and water affinity: coir is higher in pH than peat and coir is hydrophilic (water affinity) compared to hydrophobic peat (low or no water affinity). In other words, it is easier to rewet dry coir than dry peat. There may

be very inexpensive coir available, but this may be high in salts. Higher quality coir has not been stored in brackish ponds, or has had the salts leached out. Be sure that the electrical conductivity of coir is low (salts leached out) before purchasing it.

4. Improving Water Use Efficiency. If you live in an area where water is expensive, consider improving water use practices by converting to pulse irrigation, growing low-water use plants, and using drip irrigation instead of hand irrigation or overhead irrigation.

5. Water/Fertilizer Recycling. Recycling irrigation water can be very cost effective, especially if fertilizer is injected into the irrigation water. With overhead irrigation practices, approximately 50% of irrigation water can be recycled. This can result in major savings in recycled water and fertilizer.

6. Integrated Pest Management (IPM). Adopt IPM programs. By routinely monitoring crops for pests and diseases, and spot treating for infestations as needed, costs of pesticides, fungicides, etc. can be reduced.



CORF/EHRIC 2008 PROGRAM CALENDAR

ABCs of Plant Pathology

Working fundamentals of plant disease diagnoses and mitigation. Presented in **Spanish only**.

October 14, 7:30am -3:00pm in Escondido at 1670 East Valley Parkway
(Contact Jim Bethke at 760-752-4715 or jabethke@ucdavis.edu for details.)

October 15, 7:30am -3:00pm in Ventura at 669 County Square Drive #100
(Contact Julie Newman at 805-645-1459 or jpnewman@ucdavis.edu for details.)

October 21, 7:30am -3:00pm in Watsonville at 1432 Freedom Boulevard.
(Contact Steve Tjosvold at 831-763-8040 or satjosvold@ucdavis.edu for details.)

Light Brown Apple Moth (LBAM) Workshop

Identification, ramifications, and eradication

Tentatively scheduled for **November** in Watsonville.
(Contact Steve Tjosvold at 831-763-8040 or satjosvold@ucdavis.edu for details.)

For on-line registration: <http://corf.org/>

SCIENCE TO THE GROWER

SOIL MOISTURE SENSORS MAY AID IN WATER AND ENERGY CONSERVATION

Richard Evans, UCCE Environmental Horticulturist

The energy costs of ornamental crop production that usually come to mind are those associated with heating, cooling, lighting, and transporting plants. The energy costs of irrigating can be high, too. The amount of energy required each day to pump enough water from a well to irrigate an acre of plants in a greenhouse can easily exceed 30 kW-hr, so irrigating efficiently can conserve both water and energy.

One of the many challenges for growers is assessing the amount of water their crops actually use. Fluctuations in weather and differences in plant size can cause overestimates of plant water use that result in a waste of water and energy due to overirrigation. Although tensiometers and other devices that measure soil moisture have been available for decades, they have drawbacks that keep them from being widely used in nurseries and greenhouses. Growers report problems with tensiometers, such as loss of contact with highly porous substrates and a need for frequent maintenance. Time domain reflectometry probes don't have those drawbacks, but present other problems: they are expensive, unwieldy, and difficult to pronounce quickly three times in succession.

A group of researchers in Georgia recently evaluated two relatively new types of moisture sensors, ECH₂O and Theta probes.¹ Both devices exploit the high permittivity of water to estimate the water content of container substrates. You might think that permittivity applies to questions like Why can't Johnny read? or What is going on with the loan industry? Actually it is a characteristic that describes how a medium affects an electric field. Air and solid materials tend to have low permittivity, but the permittivity of water is 20 to 80 times higher. The ECH₂O and Theta

probes can sense small changes in water content by detecting the change in permittivity, so they have great potential for use in plant containers.

One big concern of the Georgia researchers was the effect of changes in temperature and salinity on the accuracy of the probes. The permittivity of water decreases as temperature increases, so these sensors might underestimate water content as soil water heats up. Dissolved salts weaken electric fields and could confound the readings of the probes. In their tests of these devices in several container mixes exposed to temperatures of 50 to 105°F and salinities of 1 to 5 dS/m, the researchers found that ECH₂O probes are accurate at low salinity, but are affected somewhat by increases in salinity. Temperature also affects them, but it was possible to compensate for the predictable effect of temperature change. Neither temperature nor salinity had much effect on the accuracy of the Theta probe. The researchers conclude that ECH₂O probes are accurate enough for irrigation control; the more expensive Theta probe provides more accurate measurements, but may be too costly for general use in crop management.

¹Nemali, K.S., F. Montesano, S.K. Dove, and M.W. van Iersel. 2007. Calibration and performance of moisture sensors in soilless substrates: ECH₂O and Theta probes. *Scientia Horticulturae* 112:227-234.

Note: ECH₂O probes are made by Decagon Devices (www.decagon.com). Theta probes are made by Delta-T Devices (www.delta-t.co.uk).



NEW PUBLICATIONS

for Nursery Operators

compiled by Steve Tjosvold

New Pest Notes

from the University of California
ANR Publication Services

74137 Citrus Leafminer

<http://anrcatalog.ucdavis.edu/InOrder/Shop/ItemDetails.asp?ItemNo=74137>

74141 Sixspotted Spider Mite on Plumeria

<http://anrcatalog.ucdavis.edu/InOrder/Shop/ItemDetails.asp?ItemNo=74141>

74136 Springtails

<http://anrcatalog.ucdavis.edu/InOrder/Shop/ItemDetails.asp?ItemNo=74136>

Recently Updated Pest Notes

from the University of California
ANR Publication Services

#7461 Common Purslane

<http://anrcatalog.ucdavis.edu/InOrder/Shop/ItemDetails.asp?ItemNo=7461>

#7423 Psyllids

<http://anrcatalog.ucdavis.edu/InOrder/Shop/ItemDetails.asp?ItemNo=7423>

#7487 Red Imported Fire Ant

<http://anrcatalog.ucdavis.edu/InOrder/Shop/ItemDetails.asp?ItemNo=7487>

#7429 Thrips

<http://anrcatalog.ucdavis.edu/InOrder/Shop/ItemDetails.asp?ItemNo=7429>

#7402 Yellow Starthistle

<http://anrcatalog.ucdavis.edu/InOrder/Shop/ItemDetails.asp?ItemNo=7402>

Book

Soiless Culture: Theory and Practice. 2008. Edited by Michael Raviv and J. Heinrich Lieth. Elsevier. 608 pgs. <http://lieth.ucdavis.edu/SoilessCulture/Flyer.pdf>



REGIONAL REPORTS

San Mateo/San Francisco, Alameda, Contra Costa, and Santa Clara counties

SUSTAINABILITY CERTIFICATION PROGRAMS

Colleen Y. Warfield, UC Cooperative Extension Farm Advisor

“We are all doing something sustainable, we just need to recognize it and advertise it.” These were the words of Stan Pohmeri spoken during a day long session on sustainability at the recent Ohio Short Course. As an industry we are already practicing sustainability, but we may not have consciously realized it. If you think about the changes and decisions you have been making in your business, more than likely these were driven by economics. In this case, the concern with being “green” was probably more directly related to keeping as much “green” in your pocket as possible. After all, isn’t sustainability about making more money than you spend? Yet, the installation of drip tubes, use of ebb-and-flow tables, vacuum versus molded pots, reduced use of pesticides, and the construction of collection ponds are all practices that follow the concept of environmental sustainability. If you started listing all the changes you have made to save money, you may be pleasantly surprised to see how many of these changes also increased the overall sustainability of your business.

The definition of sustainability is elusive at best, and can essentially mean whatever someone wants it to mean. This has led to a proliferation of standards, initiatives, labels, and claims. Consumers are increasingly demanding that market claims are true. And that is one of the justifications as to why some believe we need a national sustainable agriculture standard to define a consensus. The argument was presented that in the short-run such a standard could limit “green-washing” and potentially improves market positioning, but in the long-run, if everything is labeled sustainable, what marketing niche is there?

Currently there are two sustainability certification programs in existence:

Veriflora and the European program MPS. Veriflora was initially developed for producers of cut flowers, but was expanded to include producers of potted plants. Currently there are 17 Veriflora certified growers in the United States, with nine of these located in California (Altman Plants, Ascus, B&H Flowers, Ball Tagawa, California Pajarosa, Kendall Farms, Ocean View Flowers, Resendiz Brothers Protea Growers, and The Sun Valley Group). David Pruitt from Ball Tagawa (first U.S. company to be certified) was one



of the panelists at the Short Course discussing ways to save money on the path to sustainability. Ball Tagawa has gone to a more efficient boiler system to help save costs and achieve their sustainable energy goals.

Each grower on the Ohio Short Course Panel agreed that the information they received from the sustainability certification process helped to make their businesses better. Abe Van Wingerden, president of Metrolina Greenhouses in Huntersville, NC, said it was helpful to have someone with a fresh perspective step back and look at his operation. DS Cole Growers were able to reduce their costs of pesticides after becoming more diligent with their scouting and cleanliness as part of their MSP environmental certification. The cost of Veriflora certification ranges

from \$1,100 per year for a small operation up to \$6,000-\$9,000 per year for a large operation. Most businesses fall into the \$2,500-\$4,400 range. Annual re-certification is required.

Who is driving the sustainability issue? Most will tell you: the marketplace. However, Abe Van Wingerden said he was cautious about how many marketing dollars to put behind the seal of certification because despite all the changes they made, they have not yet found the consumer buzzword to get sales. Perhaps it is just a matter of time. While only 11% classify themselves as extremely green now, 43% of Americans think they will be extremely green in the next five years according to the Wal-Mart Live Better Index 2007. Currently 50% of consumers choose products based on one or more sustainability attributes (Information Resources, Inc. 2008). Can the floriculture industry effectively educate the end consumer about our sustainability practices without the need for a certification program? Lloyd Traven of Peace Tree Farm stressed that if you are doing sustainable things, you need to tell people. Do you want consumers driving the sustainability issue, or should producers hold the reins?

Observation

If you are interested in learning about the proposed Sustainable Agriculture Practice Standard, you may want to consider attending the GrowerTalks Sustainability Conference in Frisco, Texas (near Dallas) on November 8-9, 2008. The program is available at www.ballpublishing.com/conferences. Topics include understanding the draft standard and green certifications, marketing your green products, sustainable production methods, energy management, sustainable IPM, and more.



REGIONAL REPORTS

Santa Cruz and Monterey counties

EQUIPMENT REBATES

Steve Tjosvold, UCCE Environmental Horticulture Farm Advisor

Want help purchasing energy saving equipment? Pacific Gas and Electric Company, serving many agricultural operations in California, is offering a variety of rebates for business customers who purchase and install energy-efficient commercial equipment. Thinking of changing from high pressure sprinklers to micro-sprinklers? Think energy rebate, too. This offer ends December 31, 2008. The following programs may interest the ornamental nursery and greenhouse producer.

Greenhouse Heat Curtain: Only installations of interior curtains for heat retention in existing gas-heated greenhouses for agricultural use qualify. The rebate applies to only one curtain installation for (1) a new curtain, where none previously existed, or (2) replac-

ing an existing curtain that is no longer functional. This curtain material must be installed above the conditioned space where the gas heat source provides hot air to plant and seed species. The rebate amount is for square footage of new heat curtain and cannot exceed the square footage of the greenhouse floor. An overhang and overlap of curtain material does not qualify for a rebate. The product must be designed by the manufacturer to be a heat curtain, and the installation must have the ability to automatically or manually move the curtain into place. Curtain material must have an energy savings rating of > 40% and must have a warranty/product life of five years.

Infrared Film for Greenhouses: Installations of infrared, anti-condensate,

polyethylene plastic with a minimum 6 mil. thickness for heat retention on existing heated greenhouses will qualify for a rebate.

Low-Pressure Sprinkler Nozzles: Customers must convert from a high-pressure sprinkler nozzle system (50 psi operating pressure or more at the sprinkler head) and this must be accompanied by a pumping plant analysis to ensure reasonable pumping efficiency (45% overall efficiency or above) after the conversion. Portable hand move or solid set systems may apply.

Find more information on the rebates at <http://www.pge.com/mybusiness/energysavingsrebates/rebatesincentives> or call 800-468-4743.



TRANSPORT COSTS RISING FOR YOUR AGRICULTURAL OPERATION? Look at What a Venerable Nursery Stock Operation is Doing in England

Steve Tjosvold, UCCE Environmental Horticulture Farm Advisor

Johnsons of Whixley, one of the largest nursery stock producers in England, has six growing grounds in northern England with nearly 3 million plants and 2,000 varieties in production at any one time. It is the largest producer of specimen plants in England and up to 80-liter specimens are produced. Plants are sold and transported by a dedicated fleet of trucks all over England. The United Kingdom and Europe in general have had much higher diesel and gasoline prices than the United States for many years, and this has forced them to be very conscientious about fuel costs for transport of nursery stock.

I visited their primary production nursery near York last year. John Richardson, the nursery's principle manager, developed an innovative transport system that maximizes the density of packing and transport of nursery stock. (See photo at right.) The system uses a

custom made metal "cage" where container stock can be stacked and packed. The cages can be lifted and moved with a forklift and stacked in trucks specifically designed to handle them.

Indeed there are limitations to this method. The primary limitation is that only plants that could tolerate such packing without damage would be suitable. This nursery is only caging woody tree, shrub, and conifer species that can tolerate this practice. Their customers sometimes deal with some plant imperfections after shipment, but support this practice because of the significant transportation cost savings.

For some of you, this packing practice may seem a bit extreme or at least not suitable for the species you produce or for your market. However, this method used by a mainstream, successful nursery business in England presents an alternative solution to transportation

expenses that you should consider in our present — and future — situation with high transport costs. The number of units per volume, or density, can be very important in the cost of transport. Think about it. How can you be more efficient in the packing and transport of your product?



REGIONAL REPORTS

Santa Barbara and Ventura counties

ROLL BACK METERS WITH WIND POWER

Julie Newman, UCCE Farm Advisor

Electrical rates are predicted to sharply escalate due to state power grid dependence on fossil fuels. In addition to implementing technologies and practices to conserve energy, proactive growers are evaluating alternative or renewable energy sources for pumping water, cooling greenhouses, and reducing overall electrical use.

One option, recently promoted in *Central Coast Farm and Ranch* published by the Farm Bureau of Ventura County, is the use of small- to medium-scale wind turbines. Wind power is the fastest growing energy sector and is currently the lowest cost alternative for electricity in agricultural operations. Modern wind turbines used in agriculture are not the massive machines with huge rotor blades used for grid-level generation, or the noisy, dangerous eyesores that people have imagined them to be in the past. Although their height is definitely daunting, some claim they are less noticeable than wind machines used in orchards for frost control.

Wind turbines are suitable for many agricultural operations in the coastal plains and canyon areas of Ventura and Santa Barbara counties where there are year-round coastal breezes. The Department of Energy measures wind power on a scale of 1 (weakest) to 7. If winds on your site are at least class 2 (annual wind speeds averaging 9.8-11.5 mph), it may be suitable for wind generation. Look for wind strength maps for both northern and southern California at <http://rredc.nrel.gov/wind/pubs/atlas/maps.html#3-54>. There are also detailed maps at the California Energy Commission website <http://www.energy.ca.gov/maps/wind.html>. Even without strong prevailing winds, wind power can be justified with increasing utility rates.

It is recommended that turbines be mounted at least 65 feet high to raise the wind turbine above turbulence generated by the ground and obstacles such as buildings and trees. Understanding the permitting process involved for these tall structures is critical. In local jurisdictions that have not explicitly authorized wind towers as a permitted use, installing a tower taller than 35 feet requires a conditional use permit or variance. Obtaining these special authorizations is often a lengthy and expensive process. Some contractors offer services that include completing the permitting process for you. Alternatively, a microturbine could be mounted on a tower below 35 feet for smaller electrical needs or in groups to collectively generate power. An excellent reference guide for purchasing small wind turbines can be found at http://www.awea.org/smallwind/documents/WindGuide_final.pdf.

There are numerous state and federal incentives available to growers to offset costs. The California Energy Commission offers rebates of up to 50 percent off the total installed cost of qualified wind turbines up to 10 kW for customers of Southern California Edison, Pacific Gas & Electric, San Diego Gas & Electric, and Bear Valley Electric. In addition, the IRS offers energy tax credits and depreciation deductions. Check out USDA grants and loans that can help shoulder the costs of renewable energy projects at <http://www.rurdev.usda.gov/rd/energy/>



LBAM QUARANTINE IN CARPINTERIA

Julie Newman, UCCE Farm Advisor

A male Light Brown Apple Moth (LBAM), a “Class A” pest, was trapped in Carpinteria in February 2008. A second trapping triggered a quarantine in a 10-square-mile area on March 21. Since then, one moth was trapped in mid-May. Previously, only single trap finds were reported in Central Coast and Southern California counties, with the major battlefield confined to the Bay Area and Monterey and Santa Cruz counties.

When news of the first Carpinteria LBAM hit, nurseries were gearing up for Valentine’s Day. The California Cut Flower Commission and the Ag Commissioner worked with the USDA to set up a proactive, pre-inspection program before the quarantine was declared. A contract coordinated by the Ag Commissioner and paid for by growers brought in extra people to help with the inspections.

The LBAM quarantine program in Carpinteria includes trapping and mating disruption. There are 14,000 pheromone-treated twist-ties fixed onto host plants and fences. The ties are used for two projected life cycles that, depending on the weather, can take one to two months. Pesticide sprays may be initiated if mating disruption fails. If there are no new sightings, traps are monitored for one additional life cycle. At this point, the full treatment process could be complete by mid-November. Meanwhile, all plant material leaving the area needs to be inspected for the moth to prevent spread to other areas, and there are protocols to deal with any finds in nurseries. Extensive trapping is also underway in Ventura County as a safeguard measure.



REGIONAL REPORTS

San Diego County

ENERGY CONSERVATION MEASURES IN ORNAMENTAL PRODUCTION: TAKE ANOTHER LOOK

James A. Bethke, UCCE Farm Advisor

Occasionally we all have to stop looking in the rearview mirror and look forward again. This is one of those times. I am sure many of you are satisfied with the way you are doing things and you believe that you are doing them in an efficient manner. Sometimes, however, doing things the same way is the old way. Things change. One significant change for all of us is the rapid rise of fuel and energy costs. It doesn't seem that long ago I visited some cut flower growers in northern California, and they were saying the recent rise in energy costs was driving them from the business. They just simply couldn't compete. Obviously, energy prices are on the rise, especially oil and gas. Just think about all the petroleum-based products you use or are in your structures!

What can you do to offset these rising costs? First, reevaluate all your production systems in search of cost cutting measures. In addition, consider retrofitting some of your production to be more "green" or to use less petroleum products. I am working with an organic grower in San Diego County who converted every vehicle to natural gas, and he is now starting to convert to vegetable oil fuel. It takes some work, but he is willing to make the sacrifice.

Another local grower calculated that from January through May 2008 they experienced a 3% increase in heating and transportation fuel compared to the same period in 2007 as a percent of sales. All other fixed utilities such as water and electricity have increased by about 0.35% of sales. For that grower, it was a large amount of money, and he made very significant changes in the way he does things.

Below is a list of things I've gleaned from a variety of web sites that

you can consider implementing in your production that might have a significant impact on energy costs and your energy conservation footprint.

Maintenance

It's time to routinely clean reflectors on supplemental lighting fixtures to increase efficiency. The efficiency of your furnaces can be greatly increased by properly cleaning and adjusting, and don't forget the filters.

Recycling

Recycle all materials you can in your production (cardboard, plastics, paper, metals, and glass). Pot recycling should be first on your list. Retailers are encouraging their customers to return pots for recycling, and thus customers return. And remember to recycle that old poly house roof.

Purchasing

Review the sources of all materials. Rather than purchasing compost, consider making your own. If you do purchase compost or other media, consider local suppliers. There's a big movement to use rice hulls instead of perlite because perlite production uses petroleum and fossil fuels.

Retrofit

Replace incandescent lamps with compact fluorescent lamps or other energy saving products. When it's time to replace old heaters, consider converting to one that uses alternative fuel. The use of solar cells or wind power to create on-site electricity is becoming more popular. Use heat retention curtains to conserve energy.

Vehicles

Consolidate delivery orders to reduce fuel usage. Convert your vehicles to use alternative fuel sources.

ASIAN CITRUS PSYLLID

James A. Bethke, UCCE Farm Advisor

The Asian citrus psyllid, *Diaphorina citri* Kuwayama, poses a serious threat to the citrus industry in California. If introduced into San Diego County, the pest will have a significant impact on selected aspects of the nursery industry



as well. It is not a difficult pest to control and does not harm mature citrus to any extent, but the insect is associated with citrus greening disease, which has devastated the industry in much of the world. The disease stunts young trees, causes premature fruit drop, reduces fruit size, causes bitter fruit, and eventually kills the tree. The psyllid, introduced into Florida in June 1998, had spread to 31 counties by September 2000, primarily by movement of nursery stock. In an effort to eradicate infestations, Florida removed approximately 65,000 acres of citrus, which relates to about one third of the citrus growing area in California. The Asian citrus psyllid was recently found in 19 sites in Tijuana, Mexico and some sites are within a quarter of a mile of the California border. The local citrus industry, USDA-APHIS, and the CDFR are very concerned and similar protocols to ones used in Florida will be used here if an infestation occurs. Regulated plants will be treated prior to shipping out of a quarantined area and plants that are hosts to citrus greening will not be moved to any uninfested citrus growing area. For a list of regulated plants, see: www.aphis.usda.gov/plant_health/ea/downloads/citrusgreening-ea-10-07.pdf



UC CAMPUS NEWS

Compiled by Julie Newman, UCCE Farm Advisor

AMANDA CRUMP

NAMED ENVIRONMENTAL HORTICULTURE ADVISOR

Amanda Crump is the new environmental horticulture advisor for Fresno County. Fresno is the leading agricultural county in California and in the nation. The gross production value is \$4.8 billion, and more than 350 commercial crops are produced, including ornamentals. Amanda was born and raised in Bancroft, Idaho, a small town east of Pocatello. She earned her M.S. in plant pathology and weed science at Colorado State University in Fort Collins and her B.S. in agricultural education at the University of Idaho in Moscow. Prior to joining UC, Amanda conducted

research at USDA-ARS in Parlier and taught at California State University, Fresno. You can reach her at acrump@ucdavis.edu or (559) 456-7554.



KAREN ROBB LEAVES UC

Karen Robb resigned from the University of California on August 1, 2008 after 20 years as a UC advisor, and with nearly 12 years of service as a researcher in the Department of Entomology at UC Riverside, where she received her Ph.D. In 1989, Karen joined the San Diego County Cooperative Extension office as the floriculture and nursery crops advisor and developed a large applied research and educational program to address the needs of the ornamental production industries. In 2005, Karen became County Director in Mariposa County, where she continued to work as a farm advisor for a diverse agricultural production industry.

During her career, Karen built an international reputation as an expert on thrips and Tospoviruses vectored by thrips. She was one of a team of advisors who worked with the floriculture industry to expand the CORF program from one statewide annual meeting to its present format of multiple educational events, including bilingual programs, and a statewide newsletter. Karen received numerous research awards from industry groups such as the California Association of Nurseries and Garden Centers, the American Nurserymen and Landscapers Association, and the Southern California Rose Society. She also won a San Diego County Flower and Plant Growers Association Outstanding Person of the Year award and two UC Distinguished Service Awards for Outstanding and Creative Teamwork for her work with CORF.



FARM WATER QUALITY PLANNING PROJECT WINS EXCELLENCE AWARD

The Farm Water Quality Planning Project received the Western Extension Directors' Award of Excellence for 2008. Project leader Mary Bianchi, horticulture advisor for San Luis Obispo and northern Santa Barbara counties, was the recipient at the Summer Directors' Meeting in July in Fairbanks, Alaska.

For seven years, project collaborators offered water quality education

to growers in Santa Barbara, San Luis Obispo, Monterey, Santa Cruz, San Benito, Santa Clara, and San Mateo counties. Floriculture and nursery crops were among the commodities targeted, which included contributions from Farm Advisors Aziz Baameur, Steve Tjosvold, Julie Newman, John Kabashima, and Darren Haver.



From left: Richard Smith, Monterey County; Darren Haver, Orange County; Aziz Baameur, Santa Clara County; Michael Cahn, Monterey County; Steve Tjosvold, Santa Cruz County; Mary Bianchi, San Luis Obispo County; John Kabashima, Orange County; Bill Coates, San Benito County; Julie Newman, Ventura County; Laura Tourte, Santa Cruz County; Mark Battany, San Luis Obispo County; Mark Gaskell, Santa Barbara County; Ben Faber, Ventura County; and Larry Bettiga, Monterey County.

RESEARCH UPDATES

PLANT PARASITIC NEMATODES IN RIVERSIDE'S HISTORIC ROSE PLANTINGS

J.O. Becker¹, J. Darsow¹, M. Mundo-Ocampo¹, J.A. Smith Becker¹,
J.F. Karlik², and U.K. Schuch³

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Victoria Avenue is a scenic four-mile long parkway in the city of Riverside, California. It was constructed in 1892, based on Victorian landscape design. With more than 90 different tree species and miles of rose plantings along each edge of the median, the Avenue is recognized as a Cultural Heritage Landmark and is included in the National Register of Historic Places. For a number of years, volunteers of the nonprofit citizen group "Victoria Avenue Forever" have planted own-rooted *Rosa* sp. -Ragged Robin to fill in the gaps in the rows of rose bushes. As not all the replantings were successful, we surveyed part of the decades-old rose plantings for infestations of plant parasitic nematodes. Soil cores were taken from the root zone of hundreds of apparently healthy rose bushes. The

samples were pooled and processed for nematode extraction. Plant parasitic nematodes found were primarily lesion (*Pratylenchus vulnus*), root-knot (*Meloidogyne hapla*), and dagger nematodes (*Xiphinema* sp.). Lesion nematodes occurred at relatively high population densities in the soil, which suggests an even larger reservoir within the rose roots. The population of *M. hapla* was low but both root-knot and lesion nematodes are known to predispose plants to other soilborne pathogens. The main concern with dagger nematodes on roses is their potential to transmit certain plant viruses. The survey suggested that the nematode species and population densities present might be a significant challenge for the replant efforts.



CORFnews

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If you have suggestions, comments, or items you would like to see in this newsletter, please contact:

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WEBSITES FOCUSING ON ENERGY COST REDUCTION FOR NURSERYS

Compiled by Jennifer Orsi,
UC Davis Graduate Student

<http://www.ars.usda.gov/Research/docs.htm?docid=11449>

The USDA's Agricultural Research Service created a model that allows growers to build a virtual greenhouse to help estimate heating costs and plant growth. The software can also be used to compare costs using numerous types of heating systems and heating schedules.

<http://www.hrt.msu.edu/Energy/Notebook.htm>

Several articles and government links provided by Michigan State University, about greenhouse energy cost reduction strategies including lighting, temperature, energy-saving technologies, and alternative fuels.

http://www.uwex.edu/ces/ag/issues/naturalgas/documents/Reducing_Natural_Gas_-_Gree.pdf

Useful information provided by the University of Wisconsin about reducing the use of natural gas and propane in greenhouse heating.

<http://www.fypower.org/agri/tools/rgl.html>

The California Energy Commission has a detailed list of available energy rebates that you can search for by zip code.

<http://ucce.ucdavis.edu/files/filelibrary/5356/32048.pdf>

An older but still relevant brochure describing various methods for estimating energy use and ways to reduce energy costs in greenhouses.



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