Conservation Quarterly

Fall 2008 Volume 12 Issue 1

USDA NRCS United States Department of Agriculture Natural Resources Conservation Service

Published by the Yolo County Resource Conservation District

Yolo County Resource Conservation District

Dixon Ridge Farms: Organic Walnuts and Bioenergy Production

by Diane Crumley

East of the town of Winters is Dixon Ridge Farms, where Russell and Kathleen Lester produce organic walnuts on 500 acres of their 1,250 acre farm site. From the road, the predominant view on the spring day I visited included generously spaced trees, and an orchard floor of diverse cover crops in bloom and buzzing with pollinators. From this quiet roadside scene, it is not immediately apparent that Dixon Ridge Farms is the largest handler of organic walnuts in the United States, processing and shipping from over 65 organic growers. Originating from this quiet Winters locale, their Chandler "blonde beauties" can be found nationally in organic outlets such as Whole Foods, and there is an increasing international market for this product in places such as Japan, where Lester sells them by their varietal names, similar to the marketing of wines elsewhere.

Both 1977 UC Davis graduates, Russ and Kathy set about farming at Dixon Ridge in 1979, when Russ bought the property from his father, Will Lester, thus continuing a century-long family farming tradition. Russ and Kathy reside and work at Dixon Ridge, and have raised five daughters there. Continuing along the multi-generational farming path is daughter Jenny Lester Moffitt, who works as Managing Director, handling sales, marketing, and business administration. Russ removed the unproductive almond orchard originally on the property, and began the transition from traditional to organic farming methods. In 1992, Dixon Ridge sold its first certified organic shelled walnuts, and have consistently expanded sales and production each year, achieving on average a 40% increase per year between 1992 to 2007.

Russ Lester & Jenny Lester Moffit continue a family tradition.

Whole system farming

Although producing a premium quality walnut is one of their primary objectives, the farm's goals are broader reaching, and include a strong commitment to sustaining family farming, providing secure jobs for their 36 employees, and supporting education, research, and the ecosystem. Russ employs a whole systems approach based on enhancing what is already in place. Russ clearly recalls the advice received over a decade ago by UC Cooperative Extension specialist, Walt Bentley--protect and utilize the natural predators and parasites that are commonly found

Continued on page 2

Inside this edition:

Dixon Ridge Farms, continued from page 1

in walnut orchards. Thus, the use of a variety of cover crop mixtures can be viewed as the starting point for the Lester's "whole system" farming plan.

In the portion of their orchards where water is available to the entire soil surface, and where maximum nitrogen is needed, they apply their "rich mix" of cover crops that include a variety of vetch types (woolly pod, purple, and common), crimson and sub-clover, burr medic, and barley, oats, and cereal rye. In the orchards with micro-sprinkler irrigation, they use a different mix that produces less biomass, but produces earlier seed and nitrogen production under drier soil conditions. Their cover crops grow during the season of walnut tree dormancy, so this minimizes competition with the trees for water.

Cover crops benefit organic walnut production in a number of ways: providing nitrogen fixation, stimulating soil microbial activity that aids in the eventual release of nutrients from organic matter, suppressing weeds, and controlling soil erosion and reducing soil compaction. Cover crops also increase biodiversity and can attract, feed and harbor prey for beneficial insects, spiders and predatory mites. Also important is the potential reduction in dust, which benefits air quality and reduces conditions attractive to spider mite pests.

Staff

Reduce, Re-use

After harvest, pruned tree limbs, leaves and twigs are chipped and re-applied to the soil surface, and walnut hulls are dried and then spread back onto the orchard floor. This is an efficient improvement on traditional practices that typically involve burning the piles of post-harvest waste.

Water from the flood-irrigated portions of the farm is retrieved in small basins and recirculated into the irrigation system for re-use. With assistance from an Environmental Quality Incentives Program (EQIP) contract last year, the Lesters have installed over 200 acres of sprinkler irrigation, and will be planting filter strips and habitat-enhancing hedgerows along orchard borders. Walnut shells removed during processing are placed around the sprinklers to discourage weed growth.

Shell Power

In addition to their efficient farm resource recycling, Dixon Ridge Farm is now home to the BioMax 50, an extremely innovative biopower system that converts biomass residues from their walnut shells into "clean and green" electricity, heat, and eventually synthetic diesel fuel. The BioMax 50 is being developed by the Community Power Corporation from Colorado as a modular bioenergy production system that to date has converted the following non-edible by-products into electricity: peanut, pecan, nutmeg and coconut shells, wood chips and sawdust, coffee husks, corn, soybeans, and chicken litter. With the help of a grant from the California Energy Commission and a $30,000 investment from Lester for a concrete slab and other infrastructure, Dixon Ridge Farms became home to one of the first four BioMax 50's in the world, and is the first to be used on a farm with the goal of eventual energy self-sufficiency.

Biomass energy is a form of solar energy stored by plants through the photosynthesis process. According to the Michigan Biomass Energy Program, this potential energy resource is quite significant. Each year, approximately 100 terawatt-years of energy are stored by plants, which is equivalent to 10 times the energy needs of current human activities!

The first module of the BioMax 50 not only provides the shells to the gasifier, but also dries the biomass by recycling the heat output from the gasification process. The second module converts the biomass to a gas that can then be used to make electricity, heat for shaft power, or eventually liquid fuels. The use of the BioMax 50 does not generate harmful emissions, and the char-ash produced can be added back to the soil, thus providing additional carbon sequestration.

So far, this system has utilized about 1/3 of the annual 2.5 million pounds of walnut shell by-product to produce $30-40,000 worth of electricity and $9,000 of

Continued on page 3

Dixon Ridge Farms, continued from page 2

propane, which has off-set 40% of their electricity usage during shelling and freezer storage, and 25% of the propane needed for walnut dryers and the heating of farm buildings during the winter. Russ's goal is for 100% energy independence by 2012, which could be accomplished by the next "model" called the BioMax 100 and the addition of a synthetic diesel fuel production module to be put in place later this summer.

Russ's future energy production goals are to increase the use of solar roof panels up to 100,000 square feet and to experiment with the production of biodiesel from walnut oil pressed from inedible walnuts, which could potentially provide 75% of the diesel needed for his tractors, trucks, irrigation and generators.

Walnut shell mound ready for use by BioMax50.

The results of this "grand energy experiment" that Russ has been conducting at Dixon Ridge Farms have broad-reaching implications, and have the potential to benefit many growers in the future. The Lesters are another prime example of the competence and innovative spirit that fortunately is so prevalent among the growers in our region. ☼

Hands-on biomonitoring lesson.

Farm workers introduced to local snakes

Snakes are an important part of a healthy ecosystem, both on the farm and in wildlife areas. Snakes eat rodent pests such as mice, moles, voles, gophers and ground squirrels that can harm crops, damage irrigation lines and weaken berms and levees. Additionally, snakes aid in controlling invasive species such as bullfrogs and red-eared slider turtles, and provide food for other beneficial wildlife species, such as raptors. Despite the potential benefits of having snakes on the farm, many farm workers concerned for their own safety will kill any snake they encounter immediately.

Jeff Clark, Cache Creek Conservancy introduces gopher snake.

On an early morning in March, YCRCD and Cache Creek Conservancy staff held an informal workshop at the headquarters of Joe Muller & Sons, to introduce farm workers to useful information about our local snakes. Jeff Clark, education coordinator at the Cache Creek Nature Preserve led the workshop with Spanish translation by Elpidio Tijerino from the Yolo County Department of Agriculture. Mr. Clark gave a PowerPoint photo presentation highlighting local species, their benefits to farmers, and what to do if you see one: "back away slowly, and give them time to get away, because they are more afraid of you, than you are of them." Participants were shown slides comparing the very common gopher snake to the western rattlesnake. Gopher snakes often attempt to mimic rattlesnakes by pulling their more slender heads back into a triangular shape, hissing, and shaking their "rattleless" tail in the hopes of fooling and scaring off potential predators.

If you are interested in hosting a snake education workshop on your farm, please contact Jeanette Wrysinski at YCRCD at 530-662-2037, ext. 118. YCRCD would like to thank Pacific Coast Producers for providing refreshments. ☼

Watershed Explorers Converge on Cache Creek for Discovery Day 2008

May is officially designated as Watershed Awareness Month in California, with the goal of emphasizing the importance of watershed education and stewardship activities at the local community level. This year, the Cache Creek Nature Preserve served as a beautiful, accessible and educational venue for the second annual Cache Creek Discovery Day. The free one-day outdoor learning event was attended by over 160 residents from

Continued on page 4

New Grants to Expand Watershed Coordination Efforts

YCRCD has recently been awarded grants from the CA Department of Conservation's Watershed Coordinator Program. The cumulative three-year funding of $373,000 will support two additional watershed coordinator positions for both northern and southern Yolo County, and will increase our capacity for regional collaboration ongoing in Colusa, Lake and Solano counties.

Photo courtesy of Phil Hogan.

Hungry Hollow region, northwestern Yolo County.

One of the new watershed coordinators, Heather Nichols-Crowell, will serve landowners in the Hungry Hollow, Dunnigan Hills and Dunnigan/Zamora regions to guide the development of local stewardship plans to address flood management and stream restoration, and to assist family farmers and other landowners in researching innovative methods for farmland protection and easement options.

South of Cache Creek in the Willow Slough watershed, a second coordinator, Chris Robbins, will focus efforts on assisting smaller, "tributary" sub-watershed groups along Lamb Valley Slough, Lower Willow Slough, Chickahominy Slough and other waterways as such groups arise. Watershed-based activities in adjoining areas such as Solano County, Putah Creek and Cache Creek will be important partnerships in terms of shared learning, program development, and larger watershed coordination.

Willow Slough watershed, western Yolo County.

Throughout the region, watershed coordinators will guide the implementation of the new Welcome to the Watershed Program (to be described in the next issue), continue working on critical resource issues including water quality, soil erosion, air quality, and assist stakeholder groups in establishing long-term funding strategies for their prioritized conservation efforts. ☼

Discovery Day, continued from page 3

Yolo, Colusa, Lake, and other Bay Area counties, who came to enjoy the watershed amongst the oak woodlands, wetlands and riparian habitat that has been restored at the Cache Creek Nature Preserve.

Discovery Day is designed for all ages with special emphasis on providing hands-on outdoor learning opportunities for elementary school-aged youth, with a broad range of topics relevant to the watershed. With 12 learning-stations, two guided hikes, and reptile and raptor presentations in the old barn, visitors had plenty of activities to explore, and enjoyed taking a rest at lunchtime listening to the Flatland String Band and Kent Reeves' cowboy poetry.

Cooling off and doing some creek-wading at the bio-monitoring station was a very popular destination among all ages, where visitors collected streambottom critters such as mayfly and dragonfly larvae as living indicators of water quality. Along the path overlooking the wetlands, students tried their hand at playing Water-use Monopoly, identifying local mammal tracks & native plants, weaving a Tule bracelet, and hands-on hydrology by carving their own channel at the stream table.

The event was organized and hosted by the Cache Creek Watershed Forum, a tri-county group of natural resource, agricultural and educational partners who meet bi-monthly to share information and develop regional, collaborative strategies to improve watershed health. Members include US BLM, Lake and Yolo Counties, East and West Lake RCD, Colusa and Yolo County RCD, Rumsey and Robinson Rancherias, Cache Creek Conservancy, Cache Creek Watershed Stakeholders Group, Tuleyome, Area Sierra Club and Audubon Society chapters, and Yolo Co. Flood Control and Water Conservation District.

Support for the event was provided by CCWF members' CALFED Watershed Program grants, Yolo County Dept. of Parks and Natural Resources, and an anonymous donor. Additional thanks go to Good Humus Farms, Fully Belly Farms, Three Docs Ranch and Manas Ranch for local produce, Woodland High School FFA for a BBQ lunch and Boy Scout Troop 68 & CCNP volunteers. We are looking forward to hosting next year's event at Anderson Marsh in Lake County. ☼

Departure and Arrivals

After almost 13 years with YCRCD, our Executive Director, Paul Robins left Yolo County for life near Watsonville with his family. YCRCD staff and board bade him farewell with a barbeque at the home of John and Marsha Anderson on June 19, and he left us with a few words of farewell:

Working in Yolo County with family farmers and ranchers, the RCD Board and staff, and agency and organizational partners for the past 12+ years has been an honor and a blessing. The partnerships and potential for good work on the ground in this county are entirely unique. I'm not sure how to express how grateful I am for what working with you all has given me; it gives me a history, technical tools and confidence to plug into my work on my new home place among 5 acres of Pippin apples and with the RCD of Monterey County, that I know I didn't have even 5 years ago.

I know I'm walking into a sea of conservation confusion in the context of light brown apple moth, food safety vs. water quality, and a $3 BILLION ag economy. I can't say I'll begrudge the sea breezes and redwood trees, but it's going to be some work regrowing the roots that I tear out from this corner of the Central Valley after 25 years. Probably what excites me the most about our new home is that I'll be joining forces with a family that has been farming that ground for well over a century. While I'm not much of an example, I hope my kids will opt to settle and work on family land there as we make our own place in the coastal small farming community. Thank you for helping me set the stage for this next step in our family's life.

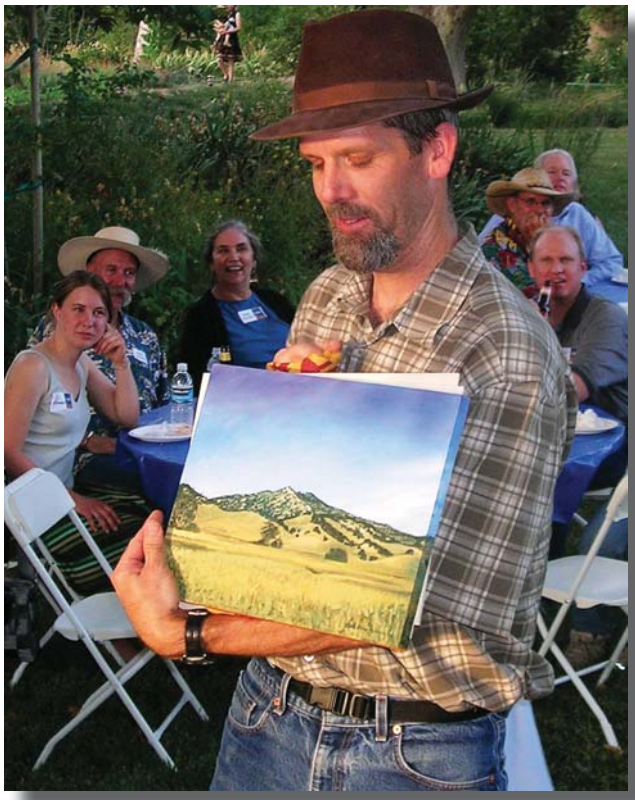

Photo courtesy of Phil Hogan.

Paul's farewell BBQ, full of tributes for a job well-done.

Paul's last day at YCRCD - monitoring sites on Cache Creek.

Please welcome DAN EFSEAFF who joined YCRCD as Executive Director in mid-August after almost 10 years with River Partners in Chico, CA. Dan was raised on a family farm in Kern County, learning the ropes of farm work before heading off to college for degrees in Biology and Environmental Toxicology. He joined River Partners in 1999 as a 'tractor driving' ecologist and has provided leadership as their Restoration Ecologist and an innovator in the field of habitat improvement in California. Together with his wife, Susan, and four daughters, Dan will be starting a new chapter in his career and life here in Yolo County. Please drop him a line or stop by to introduce yourself (or haul him around in your truck) as he gets his feet planted in Yolo loam and work forging ahead with YCRCD staff and Board.

We also extend a welcome to ALLIE SCRIVENER, who worked on several projects as a summer intern. She has been conducting surveys of the progression of the tamarisk leaf beetle along Cache Creek and has assisted our Ag Water Manager, Mark Lane, with irrigation evaluations as part of the Mobile Water Lab program. After a busy year in the classrooms of UCD, Allie has enjoyed getting an "on the ground education" on the creeks and farmlands in Yolo County. ☼

Yolo County RCD Publications

The Yolo County RCD offers various resource materials for sale. To place an order, send your request to Yolo County RCD - Orders, 221 W. Court Street, Suite 1, Woodland, CA 95695; call 530-662-2037, ext. 117; or send an e-mail to pratt@yolorcd.org.

Please add tax and shipping and handling costs to publication prices below:

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Know Your Natives - supplement ONLY $15

Bring Farm Edges Back to Life!..... $15

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Monitoring on Your Farm $15

Working Habitat for Working Farms (video) $10

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Poster: $7.50

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