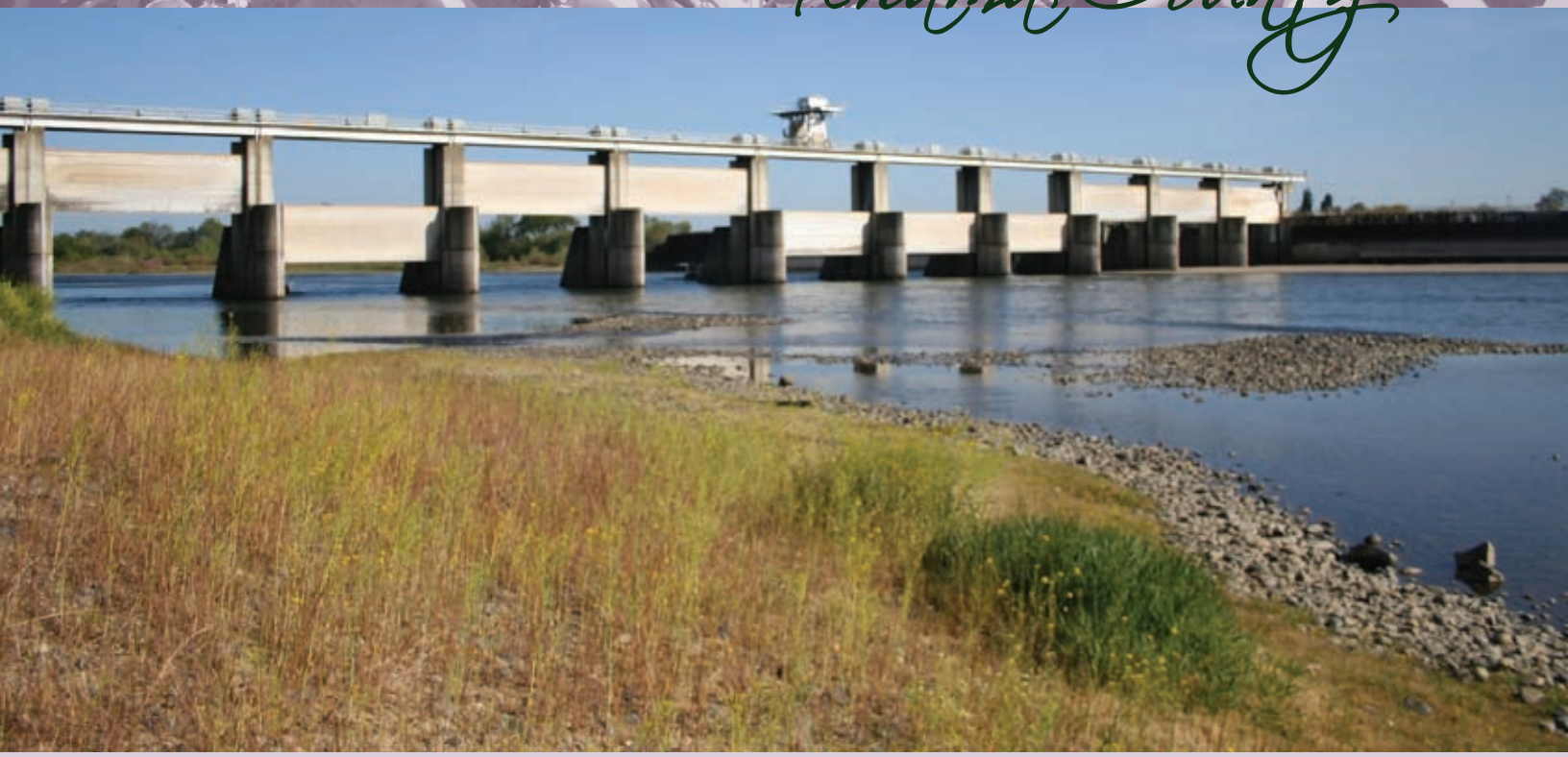
University of California Cooperative Extension

ANNUAL REPORT

Tehama County



Cooperative Extension Research & Educational Activity in Tehama County

2007-2008

Providing Research Based Information since 1918

(530) 527-3101 • http://cetehama.ucdavis.edu • email: rpbuchner@ucdavis.edu

Advisors:

Richard Buchner
County Director, Orchard Crops
rpbuchner@ucdavis.edu

Jeannette George
4-H Youth Development
jlgeorge@ucdavis.edu

Allan Fulton
Irrigation and Water Resources
aefulton@ucdavis.edu

Cross County Advisors:

Bill Krueger
Olives (Glenn)
whkrueger@ucdavis.edu

Doug Munier
Field Crops (Glenn)
djmunier@ucdavis.edu

Program & Support Staff:

Josh Davy
Livestock/Natural Resources
Program Representative
jsdavy@ucdavis.edu

Lisa Humphreys
4H/FSNEP Program Representative
lmhumphreys@ucdavis.edu

Deanna Rogers
FSNEP Program Representative
drogers@ucdavis.edu

Cindy McClain
Tehama County Office Manager
clmcclain@ucdavis.edu

Spring Severson
4-H Secretary
slseverson@ucdavis.edu

Cyndi Gilles
Orchard Research Associate

Brian McKeen
Integrated Pest Management
Assistant

Design and layout by
Terri Buchner

University of California Cooperative Extension Tehama County

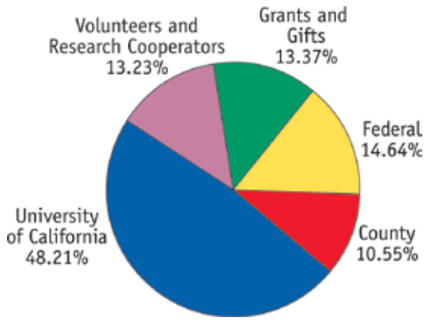
A nationwide system for non-formal education was established by Congress in 1914 to improve America's agriculture and to strengthen the nation's families and communities. A partnership was forged between the United States Department of Agriculture (USDA), the State land grant colleges and universities and county governments. Funding for its research and educational programs primarily comes from County, State and Federal governments.

Cooperative Extension was established in Tehama County in 1918. In the agreement, the County provides support staff and services in exchange for the University-paid programs and professionals.

Cooperative Extension's mission is to help all segments of the community benefit from the scientific advances in our nation's land grant universities, particularly in the areas of agriculture, natural resources, family/consumer sciences and youth development. This mission is carried out by university professionals and highly trained and dedicated community volunteers.

Major Funding Sources for Tehama County Cooperative Extension 2007-2008 Fiscal Year

University of California Support (Direct & Indirect)	$ 652,021
Federal Support (Direct & Indirect)	197,989
County Support (Direct & Indirect)	142,686
Grants and Gifts	180,927
Volunteers and Research Cooperators	178,976
	$1,352,599



163 people attended the 2008 Prune and Walnut grower meetings. Indoor meetings provide a face to face opportunity to share information.

Our Extension Team: l to r: Lisa Humphreys, Deanna Rogers, Spring Severson, Josh Davy, Jeannette George, Richard Buchner, Cindy McClain, Allan Fulton and Cyndi Gilles

Corning 4-H Community Service – Sprucing up the UCCE Office

Helping People to Help Themselves

Newsletters are written and published by UC Cooperative Extension in Tehama County extending information to county clientele.

2006/2007 4-H ALL STAR / BLAST TEAM: Mitchell Hardwick - Antelope 4-H; Megan Maloney - Olive 4-H Club; Kerry DeFonte - Westside 4-H Club (BLAST) and Bryan Wiggley - Tehama 4-H Club

Most all the office staff can be found volunteering at the Dairyville Orchard Festival in some capacity. Here Lisa is working in the Little Farmers Corner.

Allan Fulton and Cyndi Gilles share some Christmas cheer at the local elder homes.

Orchard Crop PRODUCTION Program

Richard Buchner and Cyndi Gilles

Primary Tehama County horticultural crops include walnut, prune, almond, olive and strawberry nursery plant propagation. Walnut, prune, almond, olive and "other perennial crops" had a 2007 value of $131,604,632 (Tehama County 2007 Crop report).

Economical and environmental issues will continue to present challenges for viable orchard production not only in Tehama County but throughout California. Issues such as agricultural discharge have become a much greater issue compared to years past. Both campus based and field based scientists are working with local agencies and farm cooperators to develop insect and disease management techniques that reduce environmental risk. In some production systems application timing can be adjusted to decrease environmental risk.

Program Highlights

Mating Disruption of Codling Moth

Codling moth represent a major insect pest for walnut production not only in Tehama County but throughout California. Worms chew their way into developing walnut kernels. Early season worm entry destroys the nut while late season entry results in an off grade walnut unsuitable for sale. Conventional Codling moth management relies upon insecticide applications applied when moth eggs hatch. Two or three applications are required for commercially acceptable control. Codling moth mating disruption is a strategy that utilizes pheromone to interfere with mating and egg laying. Codling moth utilize an attractant or pheromone to locate each other for reproduction. Codling moth pheromone is a naturally occurring scent produced by female moths to attract males. Entomologists have discovered how to make Codling moth pheromone and deliver it using various dispensers. New dispensing systems use aerosol cans mounted inside small plastic cabinets. Every 15 minutes a mechanism is activated resulting in a puff of pheromone. Cabinet assemblies are referred to as 'puffers.' One puffer is capable of covering two acres of walnuts. Puffers saturate the air with pheromone resulting in delayed mating and reduced egg laying.

Aerial pheromone dispensers are used to interfere with codling moth reproduction. This 'puffer cabinet' is programmed to release a burst of pheromone every 15 minutes.

Codling moth pheromone is not a human health hazard and represents a significant step toward biological insect control for walnut production.

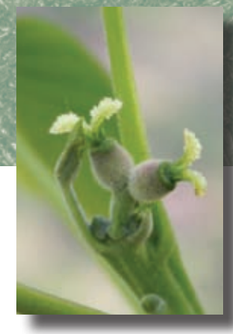
Black sunken lesions on young developing walnuts are characteristic of walnut blight. Infected nuts are killed by the blight bacteria and can result in significant crop loss.

Walnut Blight Management

Walnut blight caused by the bacteria *Xanthomonas campestris pv juglandis* is the most destructive above ground disease of walnut. Walnut blight is a problem throughout California but is particularly severe in the upper Sacramento Valley because walnuts bloom in March and April when rainfall probability is high. Left untreated, walnut blight can easily destroy over fifty percent of a walnut crop.

Small weather stations are hung in tree canopies to monitor high and low temperatures. Weather data is used to calculate insect development using Degree Days.

Long flower structures or catkins release walnut pollen. Walnut orchards are typically planted with pollenizer varieties to improve nut set.



Small walnut flowers will develop into harvestable walnuts.

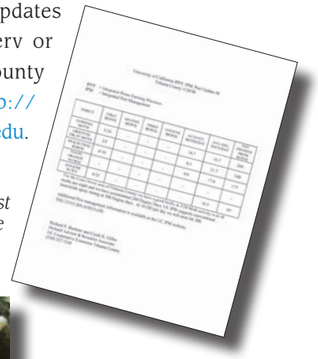
Warm weather during the 2007 prune bloom is thought to be responsible for a very light 2007 crop. Bloom conditions for 2008 appear ideal for a good set and fruit sizing potential. Frost on 4/20/08 resulted in significant crop damage.

Prayer stage of walnut shoot growth is used to time first spray applications for walnut blight.

On-going research in Tehama County has developed the most effective spray materials, application rates and spray timing. First sprays are timed to coincide with the "prayer stage" of walnut shoot development. At prayer stage, the young leaflets have not fully expanded and resemble hands held together in prayer. Good walnut blight management can maintain damage below five percent.

Detailed walnut research information is available at http://walnutresearch.ucdavis.edu.

Weekly insect management updates are available by email listserv or at the Tehama County UCCE website http://cetehama.ucdavis.edu.



Weekly Pest Update

Brian McKeen checks bug traps for the weekly pest updates.

2007 Fruit & Nut Crops[1]

	Bearing Acreage	Production Per Acre (tons)	Total Tons	Per Ton ($)	Total Value ($)
Walnut	16,702	1.40	23,383	2,301	53,803,800
Almond (kernels)	8,936	.86	7,685	3,420	26,282,600
Prune	8,633	1.9	16,403	1,486	24,374,400
Olive	5,500	4.8	26,400	8040	21,225,600
Grapes	206	3.0	618	1,500	927,000
Pistachio	181	1.6	290	3,1503	913,500
Additional perennial crops (includes acreage of other fruit crops without sufficient acreage to report separately)					4,077,732
					$131,604,632

[1]Tehama County Department of Agriculture 2007 Annual Crop Report

4-H Youth Development Program

Jeanne George,
Lisa Humphreys and Deanna Rogers

Whether youth participate in a 4-H club, projects, camp, or other program settings, the 4-H Youth Development Program's (4-H YDP) mission and goals remain the same... to engage youth in reaching their fullest potential while advancing the field of youth development. 4-H is a non-formal educational youth program that encourages youth to discover, develop and grow into competent, contributing and caring citizens. This is accomplished by focusing on citizenship, leadership and life skills in every aspect of the 4-H YDP. Learn by doing activities, youth-adult partnerships, and research-based educational programs help young people enhance their leadership & citizenship abilities and develop a wide range of life skills.

4-H Community Clubs

In Tehama County, there are thirteen community clubs serving a membership of nearly 450 youth and 184 adult volunteer leaders. 4-H clubs set the stage for learning, through individualistic, competitive, and cooperative learning. Each learning strategy teaches members to set goals and make decisions, as well as building self-confidence. In individualistic learning, a participant works alone against established criteria to show what he or she has achieved. With competitive learning, participants work against each other to show who is best. For example, to attain the goal of winning one must excel above others. Cooperative learning encourages the development of social interaction skills but takes a greater commitment of time to promote learning.

Clubs offer project work for members to develop responsibility, knowledge and skills, and explore career choices. The top ten projects for the 2007-2008 4-H year are: swine, creative arts and crafts, sheep, foods and nutrition, shooting sports, photography, horses and ponies, community pride, dog care and training, and leadership development.

All clubs participate in community service, and have responsibility to make a difference in their communities. Some examples include Red Bluff Veterans' Hall monthly clean up, Salvation Army bell ringing, community clean up and flower planting, washing fire trucks, adopt-a-grandparent and assisting at elder care homes.

4-H club members also participate in countywide education events and activities to exhibit and enhance their knowledge and skills. These events include Favorite Foods Day, Life Skills Judging Day, Large and Small Animal Education Day, Presentation Day, Fur Feathers and Udders, Livestock Judging, 4-H Fair, Fashion Revue and other project related events.

4-H Youth Camp

Tehama County 4-H Camp continues to thrive and grow. 4-H Camp's success is attributed to the commitment of the teen and adult staff. With over 100 youth, grades 4-8, participating each year, teens lead activities in archery, recreation, nature, fishing, and crafts. In-depth educational activities cover areas of music, fly fishing, survival, art, dance, and an archery field course. The process of planning and implementing camp requires a time commitment from both youth and adults. The valuable rewards are lifetime friendships.

After participating in a two-year statewide 4-H camp evaluation survey designed to identify strengths and weaknesses in the camp program, Tehama County is focusing on how to build and improve our camp program. Evaluation results identified specific areas of the camp program requiring additional attention. For example, providing challenging activity choices to youth campers. The 2007 results showed that youth campers enjoyed making decisions about what they were going to do while at camp, and the teen staff also became a larger part of the selection process enhancing life skills and knowledge.

Youth Food Stamp Nutrition Education Program (FSNEP)

Nutrition and a healthy lifestyle is a common objective for today's families. Understanding the importance of healthy food choices is easily learned at a young age and can make a life long impression. The goal of the Youth Food Stamp Nutrition Education Program (FSNEP) is to improve the likelihood that low income persons will make healthy food choices within a limited budget and choose a physically active lifestyle consistent with the current Dietary Guidelines for Americans and MyPyramid. This is done through hands on activities in a school classroom setting where FSNEP staff train teachers and provide them with curriculum and materials for implementation. In the 2007-2008 school year, over 100 teachers participated, reaching almost 3,000 students, grades pre K thru 12th, in Tehama and Glenn counties. The program is funded by USDA Food Stamp Nutrition Education.

Eat Smart Play Hard

"Eat Smart Play Hard" encourages and teaches kids and parents to eat healthy and be physically active everyday. The pilot program was designed for adults and children to work together and learn about healthy food choices, how to make fun and nutritious snacks, and quick and easy physical activities that do not require special equipment. The 6-week program was pilot tested in 2006-07. Results showed a 12% increase in nutrition knowledge and 96% self-reported a positive influence on behavior. For example, 27% consumed less soda, 21% increased water consumption, 27% ate more vegetables and 56% increased their physical activity.

Total 4-H Participation in 2007

- 2,116 youth
- 184 adult volunteer leaders

Animals in Education Settings

Two curriculums have been pilot tested in Tehama and Glenn counties in collaboration with the UC Davis School of Veterinary Medicine. "Youth Development through Veterinary Science" is designed to provide youth with an introduction to veterinary medicine through a better understanding of animal biology and behavior as they relate to assessing an animal's health. Activities were designed to be experimental, use inquiry-methods, and can be used by diverse youth audience regardless of whether or not they have their own animals. The content and pedagogy of this curriculum assist youth in becoming knowledgeable and responsible animal caregivers, as well as help prepare them for future societal roles as veterinarians, educators, food producers, 4-H volunteer leaders and consumers. "Bio-Security: Assessing and Preventing the Spread of Diseases" curriculum introduces youth to identifying bio-security risk factors and the importance of disease monitoring and surveillance involving tracking of animal movement, using Geographic Information System (GIS) and Global Positioning System (GPS). 4-H youth who raise project animals can apply these skills and technologies and map the movements of their own animals. Both curriculums also tested the effectiveness of distance learning and technology for the 4-H adult leader.

Irrigation & Water RESOURCE Program

Allan Fulton

Tehama, Glenn, Colusa, and Shasta Counties

Agriculture, environmental, urban, and industrial interests in Tehama County all need reliable, sufficient, and high quality supplies of water now and into the future. Today, about 70,000 citizens, about 100,000 acres of irrigated farmland, and fisheries and riparian habitat all rely on a combination of surface water and groundwater supplies for their needs. Since 1970, there have been about 7,500 additional domestic and agricultural wells constructed to help meet these demands. This irrigation and water resources extension program provides research, educational activities, and public service in support of water resource management in the Tehama County.

Program Spotlights:

Advances with on-farm irrigation management

Conduct research and extend new information on orchard crop response to irrigation management. We have recently completed a multi-year study of how irrigation management influences walnut, our leading commodity in Tehama County agriculture. From this study, we have clear examples of how irrigation management can influence walnut tree growth, walnut quality, and revenues. Other field research is currently being conducted in almonds, our second leading agricultural commodity in the county. We are evaluating the seasonal water requirement of a high density almond planting. This high density planting has 200 trees per acre, a much higher density than a conventional planting. High density is a more popular planting system in Tehama County.

Using a pressure chamber and midday stem water potential to measure tree water stress. It is like asking the tree about its water needs.

Weather equipment is used to measure crop water use in a high density almond orchard.

Technology is being developed and demonstrated that can help decide when to irrigate and how much water to apply to crops. Working together with Richard Buchner, UC Orchard Crops Advisor in Tehama County, and others, we have developed a method to measure tree water stress directly using a "pressure chamber and midday stem water potential." Demonstrations have also been conducted using automated soil moisture monitoring devices to aid with irrigation decisions. Weekly reports of real-time, weather-based estimates of crop water consumption are also provided in local newspapers and on our website. We also provide technical support for the Tehama County Resource Conservation District's Mobile Irrigation Lab. This is a free service available in Tehama, Glenn, Butte, and Shasta Counties and provides 'no-cost-to-the-farmer' irrigation system performance evaluations.

Field tour stop to view a dedicated groundwater monitoring well and to discuss groundwater management in Tehama County.

Sediment trap constructed at the end of an irrigated field to capture sediment from the runoff.

Local Groundwater Management

Educational program providing science-based information on the groundwater aquifer systems in Tehama County, water wells, pumping plants, and local and regional groundwater management. A web-based series of eleven related articles, each three pages in length with color illustrations are available at http://cetehama.ucdavis.edu. Meetings are also organized at least biannually to update water users on the status of groundwater management in the county and surrounding northern Sacramento Valley area. Allan Fulton is currently serving as acting chairman of the Tehama County AB3030 Coordinated Groundwater Management Technical Advisory Committee. This committee is made up of a cross-section of water interests in Tehama County and functions as a sounding board for the Tehama County Flood Control and Water Conservation District and its Board of Directors. The goal is to progress with the implementation of a countywide groundwater management plan that was adopted in 1996.

Suspended sediment in irrigation runoff at the end of a bean field.

Suspended sediment in irrigation runoff at the end of a bean field where PAM has been added to the source water.

Irrigated Agriculture and Surface Water Quality

Provide local information on water quality issues affecting irrigated agriculture. In recent years, provided education on the Irrigated Lands Regulatory Program. In 2006 and 2007, conducted field experiments to evaluate and demonstrate the effectiveness of various management tools to help reduce suspended sediment in runoff from field crops. Preventing suspended sediments from leaving farm fields has become and increasingly important issue to irrigated agriculture. A specific class of insecticides called "pyrethroids" can attach to suspended sediments and be transported with runoff and accumulate in sloughs, stream and river beds causing harm to the aquatic eco-system. If the problem is not addressed, it could affect the availability of this class of insecticides as an insect management tool.

A water additive called polyacrylamide (PAM) that is added to the source water was evaluated for controlling suspended sediments. We also evaluated the use of sediment traps and vegetated tailwater ditches for their effectiveness at removing suspended sediment from irrigation runoff.

PAM added to the source water was very effective at controlling suspended sediments but we did identify some liquid formulations that used an oil-based carrier to cause toxicity to aquatic organisms. Vegetative tailwater ditches were also effective at controlling suspended sediments. Sediment traps effectively trapped course grained sediments but did not effectively control the finer silt and clay suspended sediments that typically adsorb the insecticides.

Livestock & Natural RESOURCES Program

Josh Davy

Tehama, Glenn, and Colusa Counties

Tehama County has close to a million acres of productive grazing rangelands. Foothill rangelands are the primary forage resource for grazing animals in California (wildlife and production livestock). The importance of these rangelands is due to the unique Mediterranean type climate of the Sacramento Valley. Mild winter weather provides a source of winter forage that is unavailable in most parts of the US. In addition, the county's highly productive valley soils provide very high quality irrigated pastures for summer grazing.

Societal concerns for the preservation of native vegetation, water quality, and grazing practices directly affect livestock production. This is augmented by the growth in population targeted for the county in the near future. Livestock production is already strained by large investments and marginal returns. The livestock and natural resources program works to deliver proactive research and educational materials, in multiple subjects, that are necessary to keep livestock producers economically and environmentally sustainable.

Scientifically sound research and educational support in the areas of marketing, ranch and forage management, feeding and supplementation strategies, grazing and natural resource management is tailored specifically to clientele. Current and future projects cover multiple facets to keep production agriculture and natural resources healthy and sustainable.

Blue oak seedling regeneration plot.

Irrigated pasture research plot.

Highlights of Current Projects

Oak Woodland Management – Current research works to evaluate techniques and the reasoning behind natural blue oak regeneration.

Rangeland Production – Research projects aim to determine practical means of maximizing annual rangeland production and quality through grazing management, fertilization, perennial and annual forage plantings and rangeland monitoring. Management of rangelands for both native plants and animals is addressed.

Irrigated Pasture Production – The high quality of soils in the Sacramento Valley provides an opportunity to support multiple types of irrigated pasture forages. Projects use a practical approach to help in forage variety selection. Additionally research works to help management and irrigation practices that can optimize production and quality of these forage species. Current work is also testing economical means of forage testing for irrigated pasture species that could help managers determine grazing plans and test pasture nutrient use.

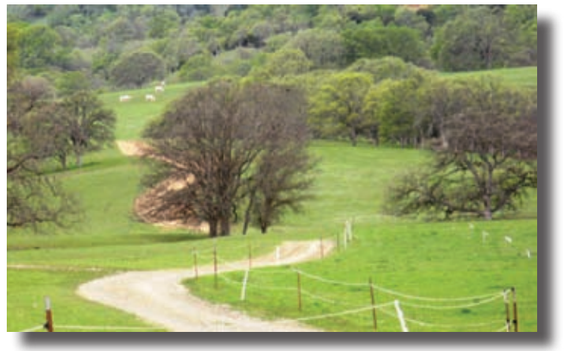
Cattle anxiously wait for the results on their irrigated pasture forage quality.

Water Quality – Water quality has evolved into an issue that is unavoidable for livestock producers. Research project constituents of concern include pathogens, sediments and even hormones. Ongoing research seeks to determine which irrigated pasture and confined animal management practices can best work to comply with California water quality regulations. Additionally, the program has been proactive in providing scientifically based information to producers so that they can become proactive in regulatory issues that may affect them.

Rangeland Weed Control – Since not all methods are applicable to every operation, numerous tactics are being developed to manage rangeland weeds. Multiple grazing studies on rangelands will determine necessary intensity and timing for the use of grazing to reduce medusahead (*Taeniatherum caput-medusae*) infestations. In addition, concurrent studies are utilizing tools such as burning, fertilization, herbicides and mowing to combat the spread of medusahead and barb goatgrass (*Aegilops triuncialis L.*).

One of 12 paddocks in a timed grazing plot.

Workshops, educational field days and extension – Numerous local and statewide workshops and field days cover multiple topics such as animal health, rangeland management and weed control, nutrition, marketing, rangeland water quality, beef production and irrigated pasture production. Multiple publications and brochures on applicable livestock and natural resource issues are available at the Cooperative Extension office. Ranch visits are conducted to extend information that can be of use to livestock and rangeland managers. A timely newsletter is also published and mailed to over 1,000 clientele interested in livestock and natural resources. Previous issues of this newsletter are available on the web at: http://cetehama.ucdavis.edu/



Cattle grazing next to a rangeland weed control test plot.

How to contact us:

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UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION — TEHAMA COUNTY

1754 WALNUT STREET – RED BLUFF, CALIFORNIA 96080