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We continue to wade into deep waters as non-native species like olive fruit fly, giant reed, the chinese mitten crab, and distaff thistle get footholds in our environment.

It's a good bet that past cultures did not face such an accelerated infestation of alien invaders. The Miwok, who managed these coastal prairies and helped fashion the environment as we know it today, had centuries to slowly shape and contour plant and animal communities. Today we are on a fast-track of ecological change never experienced before. We face these new environmental challenges with limited experience, like a new frontier: full of surprises, twists, turns.

The thistle invasions in West Marin are a sticky example. The Agricultural Commissioner, the University of California, the ranchers, and concerned activists are all searching for ways to reduce the threats to our open spaces and farmlands, and, just as important, the economic health and well being of our long-standing agricultural community. We need to work together to solve these issues, and continue the 12,000 year old tradition of responsible land management.

- Steve Quirt, Editor

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University of California and United States Department of Agriculture & County of Marin Cooperating

News from Marin County Farms, Ranches, and Producers

- ☞ UC Cooperative Extension is putting on a workshop on **raspberry and blackberry growing** on **March 30, 2006**, from 4:30 p.m. to 7:30 p.m. at the **Dance Palace Community Center in Point Reyes Station**. More information is posted on the website, www.growninmarin.org.
- ☞ **Straus Family Creamery** was voted **Best Butter in the Bay Area** by the **San Francisco Chronicle**. **Straus European Style Organic butter** has the highest butter fat content and the lowest moisture content of any of the fifteen brands of butter compared.
- ☞ **Ellie Rilla, Marin Farm Advisor**, will be leading the **2006 Agritourism & Nature Tourism Conference, "Harvesting the Assets of Your Farm or Ranch,"** Friday, March 31, 2006, from 9:00 a.m. to 4:30 p.m. in Nice, CA. Information is available at: <http://celake.ucdavis.edu/> **Phone: (707) 263-6838**
- ☞ **California FarmLink** will present **Training for Farmers on Cash-Flow Projections and Tax Preparation**, on **March 23, 2006, 3:00-7:00 p.m.**, at UC Cooperative Extension of Marin County. The cost is **\$50.00** with full scholarships available. Reservations are required. **Contact Emily Martin at (707) 829-1691.**
- ☞ **The Marin Agricultural Land Trust** will present **Food and Farming on the Urban Edge**, the New Natural Systems and Agricultural Element of the Marin County Wide Plan, **Thursday, March 23, at 7 p.m.** at the Marin Art and Garden Center. **Ellie Rilla, Aimee Crawford, Alex Hinds, and Kevin Lunny** will be presenting. **Call (415) 663-1338** for information.

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EDITOR'S COLUMN

When the first Europeans visited California, therefore, they did not find in many places a pristine, virtually uninhabited wilderness, but rather a carefully tended "garden" that was the result of thousands of years of selective harvesting, tilling, burning, pruning, sowing, weeding, and transplanting.

- M. Kat Anderson, "Tending the Wild," University of California Press

How long have we humans been tending the landscape in Marin? Well over 12 millennia. Our working landscapes and even what we designate "wilderness," has been groomed and cultivated for food for as long as humans have been a part of this lush land. A friend of mine, Dr. David Western, who followed Richard Leaky as Director of Wildlife in Kenya, Africa, once told us, "Get used to it, humans are as much a part of our environment as any species."

As part of the Marin landscape, our stewardship brings with it challenges and sometimes hard choices. Heightened global traffic has increased the risk of invasive species contamination. New species introduction and the resulting repercussions are increasing.

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Sticker Wars

Our pastures and grasslands are complex and dynamic living systems with a long and changing history. Today's ranchers and grazers have inherited from Native Americans a 12,000 year old tradition of managing these ecosystems. Ranchers work as a team with cows and sheep to maintain the grasslands that make up 60% of our open space, one of our most important cultural and natural resources.

If you walk through pasture in the Tomales or Point Reyes Peninsula area you find dozens of grass and forb species, including a surprising number of natives. You may also find some of our most noxious invasive species, like yellow star-thistle (*Centaurea solstitialis*) and woolly distaff thistle (*Carthamus lanatus*). These species

mean trouble, any way you look at it. "Stickers" are a curse and catastrophe on the ranch, and trying to control them is one of the main expenses incurred by livestock operators, whose livelihood depends on balanced ecosystem management. Generations of our ranching neighbors have fought the thistle, with intermittent wins and regular losses. Seeing productive pastures invaded and ruined by thistle infestation is, indeed, a sad sight. How did we get here?

The arrival of Spanish-style cattle management dramatically changed California's grasslands, starting with the introduction of European plants in the 1500s. These species migrated northward from Mexico and southern California; the invasion was well under way by the time Europeans reached Marin County. Our pastures today are a mix of native grasses and forbs and a host of European and Asian invaders. Many, like Italian ryegrass and soft chess, are permanently naturalized and have become mainstays for livestock forage, prized in pasture mixes. But others are perpetual pariahs, costly in loss of pasture and expensive to manage. The usual suspects are thistles: yellow and purple star-thistle (*C. calcitrapa*), woolly distaff, and Italian (*Carduus pycnocephalus*) and milk thistles (*Silybum marianum*).

When a new invasive species arrives, often the conditions are ripe for a takeover. Thistles are opportunists with disturbance and fertility providing the opening. Often seeds are transported unknowingly through hay, in grading and filling materials, on



Hand cutting of Italian thistle at the Doughty Ranch in Point Reyes Station.

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farm machinery and by importing livestock. Just a few seeds can get the infestation started, and pasture managers need to be diligent and wary to catch thistles and eradicate them while there is still a chance.

Woolly distaff thistle is the Tyrannosaurus Rex of Marin County invasives. It is an annual that forms tough, spiky stalks, which can remain standing for up to a year. These stands out-compete other species and quickly acquire dominance. Cattle refuse to enter the patches because the spiny foliage and flower heads can injure their eyes and mouths; soon the distaff is the dominant species. Each plant produces hundreds of seeds that remain viable for up to eight years or more, and germinate accordingly. This Mediterranean native is highly competitive with cereal crops and desirable rangeland species, and dense populations can develop. Distaff thistles are closely related to commercial safflower (*Carthamus tinctorius*), which precludes the development and release of biocontrol agents in California. If you have a bad infestation, you need to be attentive and diligent for at least eight years to eradicate the beast!

"Distaff is an aggressive thistle, which not only destroys good forage land, but wipes out delicate native plants as well," says rancher Sally Gale of Chileno Valley, "We stand to lose many acres of valuable pasture and open space. This isn't just another cute and quirky West Marin story; it's a serious problem."

Marin has a history of implementing creative solutions to threats to our agriculture and open space. Collaborative work is a legacy here. We have waded through thorny and divisive issues before and come up with sensible and progressive answers. In the '70s we met the development threat with zoning ordinances and the creation of the Marin Agricultural Land Trust. The Tomales Bay Agricultural Group partnered with UC Watershed Advisor Dave Lewis to monitor water quality on ranches, develop enhancements, and provide cleaner water for Tomales Bay.

Invasive species threats are not different. This, as Sally Gale says, is a serious problem; a very complicated problem, involving natural ecological forces, which we have yet to fully understand; complex socioeconomic issues, and environmental concerns. We all benefit from well-managed working landscapes and the responsible stewardship of our lush open spaces. Threats to our green "backyard" need to be met with educated analysis, understanding and the will to compromise and make difficult choices. We need to focus our collective attention on the problem and find ways to meet these problems head on. There is no right or wrong with this issue, only the long, complicated path to a solution.

A thistle by any other name

Not all thistles are the same. These four species are found in Marin, each with its own way of making trouble. Control and eradication measures differ for some species. Mowing, pulling, grazing and biological controls are all practiced with varying success rates. Spraying can be effective, yet it is expensive and may have negative environmental impacts. Here is a short description of four thistles.

Italian thistle (*Carduus pycnocephalus*)

Italian thistle, from the Mediterranean, was accidentally introduced to California in the 1930s. The flower heads are small, pink, with five to twenty heads per cluster.

On grazed lands this annual thistle reduces productivity by interfering with grazing and displacing desired grasses. It reproduces by seed, with flowering in September to December. A single plant can produce over 20,000 seeds, which last up to eight to ten years in the soil.

Hand pulling can control small populations. The plants should be cut four inches below the soil surface early in the season, before seed is set. Mowing is not a reasonable method. The plants can regrow and produce viable seed.

There is a biocontrol program for Italian thistle. A Rhinocyllus weevil has been introduced, but is not yet providing the desired level of control.

Purple star-thistle (*Centaurea calcitrapa*)

Purple star-thistle, from the Mediterranean, was found in California in 1886. It has large thorns below purple flower heads, and invades highly disturbed areas like roadsides and over-grazed pastures. It also invades well-managed rangelands. The spines discourage feeding by livestock.

This biennial can grow 1 to 4 feet and produces a purple flower head surrounded by sharp spines. It reproduces by seed even after the plant has been cut.

Grubbing and digging can control small populations. The plants should be cut 2 inches below the surface early in the season and removed from the site.

There is no biocontrol program for purple star-thistle.

Yellow star-thistle (YST) (*Centaurea solstitialis*)

YST originated in southern Europe and western Eurasia and has been in California since 1869. It is one of the most prominent invasive weeds in California, infesting over 14 million acres. It is recognized by the large thorns growing



below yellow flower heads. It is toxic to horses, causing a neurological disorder. YST is spread by contaminated forage, heavy equipment, mowers, hikers, bikers and equestrians.

YST reproduces by seed, producing 30-80 seeds on 1-1,000 seed heads per plant.

Tillage can control YST, but it exposes the soil to rapid reinfestation if not mitigated. Mowing is effective, but multiple mowings are required for maximum control. Mowing reduces spines and allows cattle to graze the plant.

There are 6 USDA approved insects for YST. Three weevils, and 3 flies, that affect the seedheads, with a 50 to 75 percent reduction in the seed populations.

Distaff thistle (*Carthamus lanatus*)

Distaff originated in the Mediterranean and is an aggressive rangeland pest, recognized by its spiny yellow flower heads. Their large, sharp spines can injure the eyes and mouths of livestock that are forced to graze within dense populations. Distaff causes lameness in animals whose hooves have been penetrated by its spines.

This winter annual grows in pastures, rangelands, and grasslands displacing desirable forages. It reproduces by seed, which disperse passively, but can remain in the seed head to mature. Seeds are dormant and viable for up to eight years. A plant is capable of producing 18,000 seeds that spread by wind, animals, and machinery.

Hand pulling controls small populations. As with any annual thistle, plants should be cut or mowed after bolting, but before flower buds form. If they are cut after flowers develop, they should be removed from the site as seed can still ripen.

There is no biocontrol program for distaff thistle because it is so closely related to commercial safflower.

Chemical control of thistles

There are a number of herbicides that will control these thistles. The most effective is Transline. The best time for application is December through April. Spraying is an effective way to control thistles, but may have negative effects on the environment. It is also costly to the operator. Most ranchers prefer not to spray, but economic realities foster some continued use of herbicides on pastures.

- Amanda Stephens, Marin County Agricultural Commissioner's Office (415) 499-6700
Photos by Charles Kennard



Pulling Weeds and Listening to Bach

The Marin Agricultural Commissioner's office and Marin Organic, in collaboration with more than 15 environmental and educational organizations in Marin County, is inviting volunteers to help ranchers with the thistle infestation currently plaguing large areas of West Marin.



Chileno Valley Ranch, the site for the thistle showdown.

The first opportunity to gather is Saturday, April 22, from 9:30 a.m. to 2:30 p.m. at Chileno Valley Ranch.

"We are hoping to have lots of participation - lending a hand, having fun, supporting the ranchers, and providing a solution, because hand-labor is part of a mix of alternatives that we are currently looking at as a non-toxic management approach to controlling weeds," said Helge Hellberg, Executive Director of Marin Organic.

Fresh lemonade and water, and classical live music in the afternoon, will be provided by the Agricultural Commissioner's office and Marin Organic. Volunteers are asked to bring their lunch and a steak knife for cutting the weeds, gloves, hats, and sun-protection. They should plan to wear long sleeves, long pants, and dress in layers as weather can change and be windy at times. Boots are also recommended, as the terrain will be steep in places.

This effort is part of building a taskforce of volunteers to support Marin's agricultural producers when they need help. "Whether it is a non-toxic approach for controlling weeds, a flood, or a barn burning down, wouldn't it be great to have a corps of volunteers ready to jump in and reach out, to come together and support each other as a community, and engage and learn from each other?" Hellberg asked.

Four Saturdays are scheduled for weed pulling at the Chileno Valley Ranch: April 22 and 27, as well as May 7 and 14, 9:30 a.m. - 2:30 p.m. For information or to sign up to participate, contact Paige Phinney at Marin Organic at 415-663-9667 or via email at paige@marinorganic.org. Thank you for your support!

- Sheila Foster, Marin Organic