

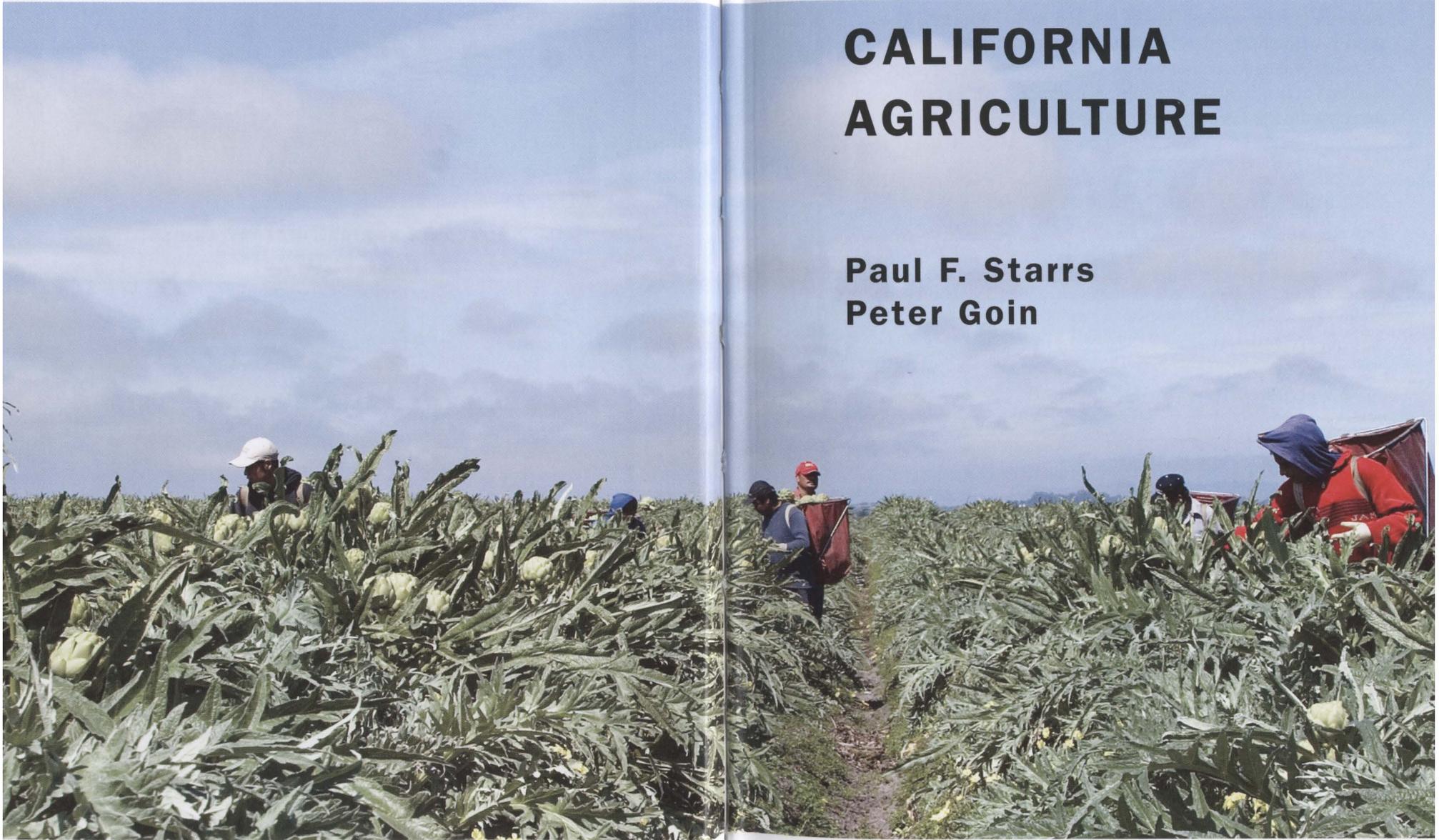
**California Natural History Guides**

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**Field Guide to** [2010]

**CALIFORNIA  
AGRICULTURE**

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and organizing commodity support to cover research, processing, and marketing, as with Sunkist or the Almond Board. Costs are not small.

Grower expenditures on equipment, land, maintenance, and labor are as big—as outscale—as the size and gross sales of growing, grazing, and dairying operations. In a USDA map showing total production expenses, California farms stand out: agriculture at such a scale is expensive. In short, being a commodity producer in California is no guarantee of big profit. To pursue agriculture at that level requires capital and commitment. Family-owned farms, which are common, embrace an LLC structure, so the family corporation is a frequent presence.

A final anecdote may help convey the outsize scale of California agriculture. We started this project with a return visit to the World Ag Expo in Tulare, which bills itself as the world's largest agricultural exposition; it was inaugurated in 1968. What used to be known as the Tulare Ag Fair is anything but a rustic county event. Set in February, when California agriculture is at its lowest ebb in terms of time demands on growers, the “expo” celebrates technology in agriculture and offers an unsurpassed opportunity for vendors to make sales. Conspicuously absent is anyone (besides fellow growers) with whom



Plate 11. Dairies benefit from feeding milk-producing cows moisture-rich feed such as silage—which is preserved, in characteristic California fashion, under plastic, held in place by split tires held together by cables.

to discuss plant varieties or innovations in agronomic technique or marketing orders. Such enterprises are undertaken in close consultation with seed company representatives, or with Cooperative Extension agents whose specialized knowledge includes those crop varieties best attuned to the requirements of a local landscape. The World Ag Expo is about technology and machinery scaled to a particularly epic Californian canvas. Featured are irrigation pipelines, milking carousels, six-foot irrigation ditch gates, mechanical grape and olive harvesters, 12-foot-tall hardpan rippers, high-tensile strength smooth-wire trellising systems, four-wheel-drive tractors, buzz-saw treetop pruners, 12-bottom plows, and the ever-popular Gopherator (imagine *Caddyshack* with exploding gopher burrows). California agriculture is pursued at many a scale, and the next sections discuss current-day variations and their influential role in the U.S. diet and in California's self-image. But within the Sacramento and San Joaquin valleys, where farmers are growers and crops are “production,” agriculture is about scale and volume. Few residents involved in agriculture would apologize for that—quite the contrary, the dominant emotion is pride of place and product.

Toward the end of the first decade of the new millennium, agriculture in California is shifting again in interesting—and not entirely predictable—ways. In California agriculture, the universal is change itself: something is always being modified, tweaked, or tried. Innovation, exploration, and experimentation are the constants, and if something potentially better or paradigm-changing is found, expect to see it where you shop within a year or two. Someone with a sharp pencil will test the financial numbers, and if they work, the product will be available for purchase before long.

## Agricultural Variations: Rangelands, Pasture, and Water Use

Crops offer an easily recognizable agricultural category: plants grow from the ground. But they are not all that contributes to agricultural production in California. There is more to

agriculture in the state than what is grown from tilled cropland. There is rangeland, pasture, and a significant wealth—and animal-producing capacity—tied up in that land, which has historically been well used.

Driving along a rural road, it is routine to see animals grazing on the other side of a barbed- or woven-wire fence. Grazing is the largest single use of land in the state. Once upon a time in California, rangeland was home to horses, sheep, goats, and cattle—with the last three raised possibly for dairy, or for meat. As open-range operations, commercial sheep and horse ranches are seldom seen now, thanks to high costs and predator issues, and dairies will rarely entrust dairy cows to the wide-open range. But cattle, goats, and in a few settings, even free-range chickens and turkeys, along with the exotic herd of llamas, burros, or emus, graze on rangelands. Properly managed, ranching on extensive range can be a picturesque and, on occasion, profitable activity.

Two forms of livestock raising predominate in California: open-range and confined feeding, with pasturage in between used by both systems. Open-range operations turn animals loose at least daily, and animals may be herded and managed to graze over hundreds or even thousands of acres. Free-range operations with small herbivores such as goats and sheep—or, for that matter, poultry—may return the animals to protected enclosures at night. Large herbivores, such as cattle and the occasional horse herd, can graze unsupervised for days or weeks on end; sheep and goats tend to be watched more closely.

If the breeds and species of livestock involved in open range grazing tend to be distinct from dairy operations, that is not always the case. Feedlot animals constitute a distinct topic; animals eating in close quarters, either in feedlots or in dairy feed yards, are yet another significant and substantial economic force in the livestock economy. In animal raising, there is crossover from grazing to dairy: male dairy calves are a big part of “cattle on feed” in the beef industry. CAFOs (confined animal feeding operations) include about a half-million cattle that are in feedlots at any given time in California, on their way to high per-day weight gain and eventual trips to slaughter. Feeds include a much more diverse mix of foodstuffs in California than in the enormous western Great Plains or Midwestern feedlots, including a variety of agricultural by-products that would otherwise go to landfill.

Confinement dairies are enormous milk producers, earning almost \$4.5 billion in 2006—the state’s largest crop. More than 1.8 million dairy cows produced an average of 1,860 pounds of milk in December 2008, down somewhat, in production from 2007, but by nationwide standards still a formidable number. Goats, raised for milk or for meat, are becoming more and more popular, in particular with California’s increasing Hispanic, Islamic, and South Asian (Indian and Pakistani, in particular) population. In the North Bay counties, and, north of that, in the Emerald Triangle, and in limited numbers along the Central Coast, sheep and goats—especially for milking and for weed control—are returning to the scene in California agriculture. Feeding of animals in dairies or feedlots is an intensive form of agriculture, discussed later by type of commodity and livestock.

Although cattle and other livestock are not likely to ever regain the sway they held over the late-eighteenth-century California landscape, they are in something of an upswing in prestige, having found niche markets. Prices for beef, mutton, lamb, and *cabrito*—young goat meat, or kid—are in a slow rise, but market variation from year to year is marked. And innovations



Plate 12. Although the sheep, lamb, and wool industry is well below its peak, young animals are in demand and, as American lamb, bring significant prices; seen here near Firebaugh.

also appear. There is a further boost of interest in grass-fed animals, as several generations of once-vegetarian consumers with baby-boomer pocketbooks decide that they are willing to eat and pay higher prices for smaller portions of meat, so long as it is raised under humane conditions, grazed in a way that minimizes exposure to grain and additives and permits the animals what might, in the aggregate, be considered a good life. Appreciating such a product requires potential consumers to develop a different palate than that of their parents and grandparents, and to front more generous food budgets. Producers tend not to mind meeting market requirements that they observe principles of better stewardship.

In all this, there is a tradeoff: although grass-fed beef takes longer to raise to slaughter weight, it captures a higher per-pound price. If transplanted Midwesterners and high-end restaurateurs roll their eyes at the quaint notion of forgoing heavily marbled prime beef in favor of two- or three-year-old grass-fed animals, modified market preferences are clearly being expressed as a consumer choice U.S. grade. California agriculture is large and varied enough that there is room for the exploration of new market strategies within the beef industry. And although grass-fed beef, for example, was not a huge success when “natural beef” marketing began to be explored in the late 1970s, techniques and the knowledge base of how to produce more palatable beef improved over the last 30 years. An entity such as the multi-product Marin Sun Farms is a highly recognizable brand name in northern California, with a sales reach increasingly far afield from the San Francisco Bay area.

## Rangeland

If a single item tends to get lost in a discussion of California agriculture, it is rangeland and its products. For this there is a reason. The term “rangeland” is to a large part of the public a kind of obscure default category: whatever isn’t cropland, deep forest, or a subalpine highland is by default considered rangeland. Actually, even forests are grazed by cattle, who sport sturdy bells in the Sierra Nevada or Cascade Range so that they can be tracked in the forest understory. The classification of everything not “cropped” as rangeland carries controversy, since almost

exactly half of California is public land controlled by federal government agencies such as the Forest Service, the Bureau of Land Management, the National Park Service, the Fish and Wildlife Service, and the Department of Defense, or by California State agencies, which are equally varied in purpose and constituency. Whether such lands should be grazed or not is a subject of continuing debate, but grazing commonly was and is a long-time use. Likely in the future a good part of California public lands will continue to be browsed by livestock.

The production of beef, calves, sheep, and even goats on the California range is economically formidable, with the category for “cattle and calves” often the largest commodity produced yearly in the state. As decade of inception goes, grazing is the oldest agricultural practice brought to California during the Spanish–Mexican era. In turn, the Spanish experience was itself a hybrid of Peninsular and North African practices that were transferred to Mexico and further adapted before traveling into Alta California in the mid-1700s. Once grazing was a commonplace in the Southwest, rules and laws native to Spain were embraced with livestock, so the “Judge of the Plains” morphed



Plate 13. The widespread insertion of new housing stock into what was historically solely rangeland is a regular phenomenon in parts of California. This land in San Benito County is grazed—around the houses.

into the modern-day brand inspector, and is still an official position in every California county.

Range livestock offers another side of California agriculture, and grazing on rangeland is an extensive use of land, in contrast to the intensive use of cropland; grazing may represent a disturbance—a change—in landscape over time, but done properly, it places a few animals over a relatively large acreage. Well-managed grazing produces nothing like the effects of plowing and laser-leveling, discing and harrowing, building check-rows and seedbeds, and heavy irrigating.

Estimates by FRAP, a division within what used to be known as the California Department of Forestry (now CalFire) hold that the grazed rangeland in California is 34 million acres, and that the area that potentially could be grazed is 57 million acres, or about 57 percent of the state's surface area. The number of animals—cattle or sheep—is much lower in California than in many other states in which grazing can take place on lowland range throughout the year. States in the southeast, such as Florida or the Carolinas, or the Great Plains states, are formidable producers, because their rainfall and grass supply are so much greater, allowing for year-round grazing.

What California offers is a crucial feature of its Mediterranean-type climate: during a wet later winter and spring season, California rangelands grow so much grass that livestock can be placed onto the range in sizable numbers. Stocker cattle are imported, generally by truck but sometimes by rail, and do their best to keep abreast of grazing the fast-growing annual grassland. When the summer dry season arrives, the feed supply plummets, and the animals are moved elsewhere, either to upland range in a modern-day imitation of the cycle of transhumance that was first practiced in California in the late eighteenth century, or to other states—or to feedlots, if their size is large enough to merit that.

## Pastureland

Almost any field in California can be grazed. After a crop is harvested, livestock are routinely moved onto the remnants or stubble left on the field. The practice isn't universal, because fencing and controlling the animals can be an issue. But there is an important distinction between rangeland, which is unirrigated and essentially natural, and pasture. Irrigated or not, pasture is

a highly significant source of feed and amounts to more than 800,000 acres of land in California. Irrigated pasture is particularly important for forage and as a grazing area for animals that are milked (including sheep, goats; and dairy cows) and for range livestock, especially once the summer dry season hits with full force. However, pasture is a formidable consumer of water, whether delivered by wheel-move line, impulse sprinkler, or flood irrigation. It offers lush feed and sanctuary from confined feeding, although the cost in water and the labor demands of sustaining a good pasture, whether in improved breeds such as Johnson grass or other imported natural pasture grasses, will seem increasingly high in drought years to come.

## Hay Crops

A common variation on pasturage is hay lands, which are planted to various species of introduced grasses or legumes, allowed to grow to maturity (instead of being plowed back into the soil), cut with a swather into windrows, cured dry in the field, and baled for transport and feeding. Hay crops include rye grass, timothy, orchard grass, clover, brome, and fescues, and when a high-protein hay is considered risky for animals (notably, horses, which lack a rumen to aid digestion), a grain field of oats, wheat, or barley also can be made into hay. Most feed stores offer several different varieties of hay, and a relationship of trust between consumer and vendor is crucial: bad hay not only is a waste of money, but can imperil the animals to which it is fed. The crucial ingredient in good hay is an appropriate mix of seeds and leafy material, so the grower will attempt to harvest when seed heads will remain attached to the stalk as the grass is mowed and then baled.

The archetypal hay is alfalfa, a perennial legume that sets deep roots and that can produce multiple crops throughout a growing season (as many as seven to 12 cuttings in the Imperial Valley, where alfalfa produces essentially year-round). The nitrogen-fixing alfalfa is conventionally harvested as hay, although it can also be chopped into a high-protein silage for feeding to dairy animals. Pollinated by bees, alfalfa honey is light-colored and prized by consumers who may not like the darker and heavier honey (sage, oak, chemise, wildflower) produced from wildland hives. Hay is cured, or dried, before it is baled, and the packaging

is tight enough that further curing will take place slowly when the hay is stacked properly. Wet hay is a danger; a tight haystack, however, whether built by hand or by a cruise-stacker—which builds layers of a haystack as the bales are picked up and then pivots them from horizontal to vertical layers at the stackyard—can sluice off a good bit of water and weather and retain nutritive qualities.

## Domestication and Its Aftermath

There is a joint irony in animal agriculture that is born of a contradiction. First, animals raised on the range tend to be a substantially forgotten element in agriculture. They are not particularly visible in day-in, day-out life, unless someone is traveling in foothill environments. Obviously, the long sheds of turkey or chicken farms, or the concentrated ammoniac smell of an imperfectly maintained dairy or feedlot operation, are readily recognizable—but those animals are not in an open-range situation. Although crop fields are evident on a satellite image, grazing cattle or sheep generally are not. Yet, as California voters made clear by approving a 2008 ballot initiative, the public does demand that animals be raised in humane conditions (even if the execution of 2008's Prop. 2 was highly imperfect). That has not spread to ranchers who graze rangeland or pastureland, but ranchers would argue that their animals must be raised in suitable conditions lest they cease to thrive, and thus claim the mantle of good stewardship as well. That is often true, and few would argue that ranchers are deliberately unkind to livestock. The perception of what is appropriate depends on who perceives what is happening. Refreshingly, at this point in California there is negligible discussion of cruelty to crops—but caring for animals is clearly a matter squarely in the public eye and awareness.

Rangeland, pasture, and hay lands represent an additional side of California agriculture, a part that serves the needs and interests of livestock, which puts animals on the land. Use of land in an extensive (contrasted with “intensive”) fashion is approaching a 250-year history in California. Rangeland use, in particular grazing, is the largest single agricultural activity in California. Long ago in California's history, land claimants bought up control of bottom lands and access to water sources

and managed these often-large tracts of land for fodder—grazing animals during the months when California can support a substantial population of cattle, sheep, horses, and goats. Not all the animals helped are domesticated; wildlife benefit from a number of improvements on rangeland or pasture that can provide added water sources and feed in the dry season.

Open space has value, too. Rangeland kept as grassland or woodland is not given over to city streets and suburban lawns, which are poor habitat for wildlife. So as long as rangeland is maintained, habitat use and improvement is a possibility. That use continues and has an added benefit: ranchers are custodians on the land whose interests are clearly aligned with maintaining the fertility and good condition of the ground, so future years will be at least as productive as now. The concept of stewardship, if not universal, is a principle supported by every rancher we have visited through the years. Ranch families tend to be made up of people who appreciate wild—at least, less developed—country, and they are far less enthused about the sorts of schemes that cities play with to encourage forms of “development” within the



Plate 14. This golf course near Coachella is a suitable reminder that according to statutes of many California cities and counties, golf courses are tabulated as “open space” and taxed as agricultural land.

urban limit line, such as sponsoring the creation of golf courses only to then classify them as “agricultural” land.

A mantra recited by ranchers happens to be true: livestock take vegetation unsuited to other uses and convert solar energy, which with water nourishes the feed into flesh that in time becomes meat. Nothing else can complete this transformation, and the grass-fed end product is healthy and—unless someone is a scrupulously careful vegetarian—even necessary, in small amounts, to human health. Livestock partisans might add that the presence of livestock further serves to enliven our existence, making the world a more interesting and diverse place, since animals were domesticated in the Neolithic by our distant ancestors and goats, cattle, horses, and sheep are therefore in some sense our boon companions—which ought to make our lives more interesting. This quiet satisfaction in the results of domestication may fade as an urbanized population roams cross-country less and less often, but awareness should not be allowed to disappear: rangeland is important, and its presence unmistakable in its significance for California agriculture.

## Farming at the Urban Fringe: Innovations and Challenges

The growth of cities, in time coalescing from town to city to megalopolis, inevitably pushes away profitable agriculture at the urban fringe. For a couple of thousand years, one of the few absolute geographical laws is that the most valuable, labor-intensive, and delicate agriculture lies close by the city, and radiates outward as the city grows. Transportation inevitably affects the process. Freeways open up land to development, bumping out agriculture with new office parks, as along northern California’s I-80 corridor. But then, easier access can open up fresh ground for vast orchards. Such is the story of the great recent upswing in almond, orange, and pistachio acreage along I-5 in San Joaquin County. If the symphony title is “Growth and Development,” then for this song California knows not just a few words of the chorus, but every variation on all the verses: Agriculture on the spectacular soils near Sacramento disappeared in the 1880s, farming was waning from San Francisco,

San Leandro, San Jose, and the Santa Clara Valley by the 1930s, and the Los Angeles Basin was fading to a handful of orange trees and scattered dairies in the decade after World War II. The important thing to understand is that urbanization is a potent lever exercising force in numerous parts of California. The challenges and possibilities deserve mention.

## Valuing Local Products

Strikingly, in an era when globalization is a byword in debates about economics, public policy, and labor, a diet grounded in locally grown foods can attract sizable interest. Such writers as Wendell Berry and Verlyn Klinkenborg, and, more recently, Gary Nabhan and Michael Pollan, emphasize the pleasures of eating what you know and what you may have helped grow through community-supported agriculture or by buying a share of a



Plate 15.  
Evocative white caps protect and shape frisée, a form of curly endive sometimes known as chicory, growing in Bolinas, California.

cow, lamb, or goat. At a more abstract level, the theory of food miles, first bandied about in the 1980s, holds that the ideal foodstuffs travel a minimal distance from their place of production. Because California (like Australia and New Zealand) ships up to 80 percent of selected agricultural produce as international exports, this idea's gaining sway could be a decidedly mixed bag. But for those eating in California, and potentially setting food fashions, the notion of buying as much locally produced food as possible resonates, with sizable implications for pricing and what is raised.

If interest in local produce and cuisine rooted in tradition is longstanding, family preference and regional habit has shifted from a casual consideration to conscious practice. Two widely separated Mediterranean-type ecosystems, Italy and California, feed and irrigate the Slow Food philosophy at the heart of this movement. The Slow Food effort commenced in Italy in the mid-1980s and, as the movement's name suggests, sought to distance itself from the American embrace of "fast food." With some 800 *convivia* chapters worldwide in 2008, Slow Food believers attempt to generate a culture of cuisine that pays attention to local animals, seeds, and foodstuffs. The movement supports farming that acknowledges local products and a distinctive regional "ark of taste" that promotes sustainably produced foods with outstanding taste and local provenance.

"California Cuisine" is a political and agricultural endeavor that began fully a decade earlier in the late 1970s. Although sometimes attributed solely to Chez Panisse owner Alice Waters, credit to the effort's progenitors is owed to a larger circle of chefs and farmers who emphasized shared themes. From its inception, emphasis in California Cuisine was on the fusion of distinct cooking styles. More important for agriculture was an emphasis on the use of ingredients raised locally and, at times, acquired at farmers markets. At Chez Panisse and other restaurants in the movement, menus change often—sometimes daily, observing the rules of what is sometimes called market dining: cooking to take advantage of what is freshest and finest in the market. (Interestingly, in 2008, when the first Michelin Red Guide to the San Francisco Bay Area came out, Chez Panisse was awarded one star, and consensus suggests that that was because the restaurant offers no fixed menu.) Other emphases include paying agricultural workers a living wage, and giving grower-producers a

reasonable return on their investment. Such ideas put the movement into elite territory, supporting more expensive food—with distinct advantages in nutrition and freshness. The shared consciousness of Slow Food and California Cuisine took and held. In 2009, these two ideas represent a strong alternative to mass, industrial-scale production of food products. This is part of the interesting dual nature of California agriculture: there is an outsize commercialized production of high-quality and relatively inexpensive foods that may circle the globe, but also a contrasting intimate and much pricier yield of foodstuffs from small-scale producers who sell to a local high-visibility market that supports farm-to-table dining.

For all the chichi attention, the "locavore" movement doesn't have everyone convinced. As author-restaurateur Anthony Bourdain writes, even among elite chefs there is a division between those who want to serve up only locally produced fare and the chefs who prefer to draw on an entire world economy of top-flight raw materials that can be moved from place to place, making anything available, if at a price. Great chefs buy into one camp or another—and to be fair, it's a lot easier to be a happy locavore in California, with hundreds of foods and farmers markets, than it is to embrace such ideas in Kyrgyzstan or Iceland—or Minnesota. Local California producers of top-flight food radiate star quality, and their products are watched for, purchased—often at premium prices—and cherished in the realm of urban food fanciers. Connections are maintained and cemented between city people and farmers beyond the urban fringe, and chefs, growers, and consumers routinely meet, as John McPhee and Adam Gopnik note, at the specialty produce store and the farmers market.

## Distribution

Tractor-trailer bins of tomatoes, garlic, and boxes of berries, kale, or lettuce routinely move along Hwy. 99 and Hwy. 101, delivering thousand upon thousands of pounds of "product" to storage. Like a constant flow of trucks and tractors on farm fields, warehousing and storage allow California agriculture to cater to national and global markets. Truck yards along the major freeways hold literally hundreds of trailers topped by massive plastic