

California's shrinking farmland

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California's fortune in having good soils, varied and temperate climates, skilled laborers and efficient managers, huge water transfer systems, dramatic applications of technology, and substantial public investment is widely recognized. It is not so clear, though, how well the state is maintaining the basic resources on which its agriculture depends.

The American Farmland Trust (AFT, a national, private, nonprofit organization dedicated to the conservation of agricultural resources) has spent two years pulling together the best available information about the ultimate agricultural resource: the land itself and the changes taking place in that land. Our purpose here is to present this information and to suggest actions to address the state's agricultural resource problems.

California has nearly 31 million acres of agricultural land: 9.5 million acres of irrigated cropland, 1.5 million acres of

dry-farmed cropland, and 19.7 million acres of pasture and grazing land. The Sacramento and San Joaquin valleys contain almost half of the farmland in the state and nearly three quarters of the irrigated land. The Imperial and Coachella valleys near the Mexican border form the next largest crop production area. Some 500,000 acres of irrigated cropland found in smaller valleys along the central coast are of special value, because the moderate maritime climate allows year-round production on a scale unmatched in the nation; several crops are grown only there.

The bulk of California's rangeland is in the Sierra Nevada foothills and in the coastal ranges from Sonoma County south. Again, lands within the maritime climate belt are of special value, in this case because grasses stay green and nutritious longer, reducing the amount of supplemental feed required.

Four factors interact to reduce the land supply or land productivity, and two may act to increase it:

□ Conversion to nonagricultural uses, usually urban, is removing some 44,000 acres of cropland and additional acres of rangeland from the land base each year.

□ Soil erosion, the physical wearing away of the land surface by wind and water, detrimentally affects some 8.8 million acres.

□ Salinization, the buildup of salty wastewater in the soil due to poor drainage, is a threat to irrigated agriculture in several areas, with at least 1.6 million acres somewhat affected.

□ Rising water costs and increasing groundwater overdraft affect farmland in several ways.

□ On the other hand, newly irrigated land is bolstering one component of the farmland, and continued technological innovation may lead to renewed increases in per-acre yields.

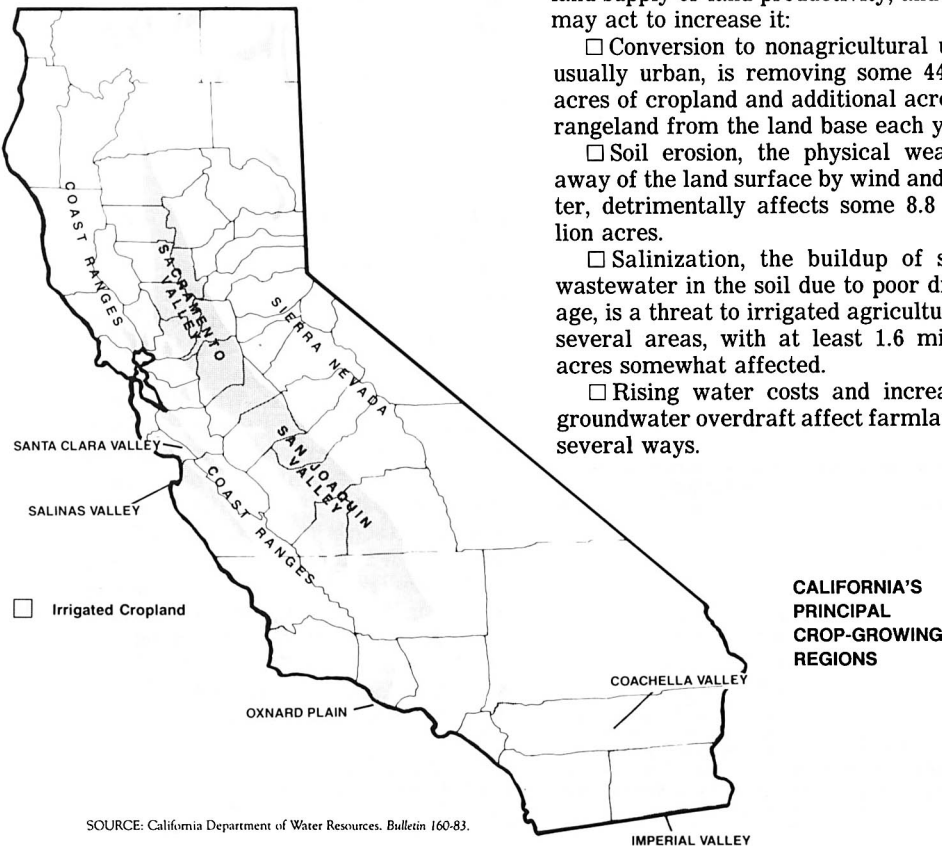
Conversion

Between 1970 and 1982, an average of 44,000 acres a year of cropland, including 36,000 acres of irrigated land, have been converted to urban use. (Comparable figures for rangeland are not available.) If this rate holds steady — it may well increase — approximately 900,000 acres that were cropland in 1980 will be urban by the year 2000. California's population is projected to increase by 7 million by the year 2000. Where these people live, drive, work, and play will determine the rate of agricultural land conversion.

The typical California city is situated on former cropland near the coast. Urbanization continues to occur disproportionately at the expense of coastal agricultural land. In San Diego County, 60,000 acres were converted between 1977 and 1982; 100,000 acres were converted in the four counties that make up the Los Angeles metropolis (Los Angeles, Orange, Riverside, San Bernardino). In five San Francisco Bay Area counties (Contra Costa, Alameda, Santa Clara, San Mateo, Marin), 41,000 acres were converted during this five-year period.

Of special concern is the immediate coastal belt. For the last several decades, Californians have maintained at least 500,000 acres of irrigated cropland in this belt. Today, little suitable land is left for the replacement of land lost to urbanization. According to AFT's survey of coastal county farm advisors, California has less than 10,000 acres of high-quality coastally influenced land for which affordable irrigation water is available. With urbanization in the maritime climate belt annually claiming over 20,000 acres, much of it farmland, the potential for loss of the entire 10,000-acre reserve is substantial.

Inland, conversion is quite rapid in the San Joaquin Valley, where 65,000 acres of mostly agricultural land were urbanized between 1977 and 1982 — 30,000 in San Joaquin County alone. At that rate, 300,000 valley acres will change use between 1982 and 2000.



SOURCE: California Department of Water Resources, Bulletin 160-83.

Even with strong protective measures, California will probably continue to lose agricultural land to urbanization, erosion, and salinity.

Erosion

Erosion, a natural process, can be greatly accelerated by improperly managed cultivation or grazing. Wind and water are removing soil at accelerated rates from an estimated 1.8 million acres of California cropland, almost 16 percent of the total, and from an additional 7 million acres of grazing land, more than a third of the total.

Hilly cropland and rangeland in the coastal mountains are particularly affected. In 12 of the 20 coastal counties, more than half of the grazing land is eroding faster than the "soil loss tolerance" rates prescribed by the U.S. Department of Agriculture Soil Conservation Service. Soil loss tolerance is an erosion rate that allows for the long-term continued sustained use of the land.

Wind erosion is significant in the Central Valley, affecting approximately 250,000 acres each in Fresno, Kern, and San Joaquin counties. Kern County is an erosion hot spot: 17,900 acres of cropland and 526,000 acres of grazing land suffer water erosion, and 250,000 acres of cropland and 446,000 acres of grazing land are losing soil to wind.

Salinization

On large acreages of farmland, salty irrigation wastewater is accumulating in the soil and reducing, or threatening to reduce, crop yields. At least 1.6 million acres of irrigated cropland face this problem, due in the Imperial Valley to heavy, slow-draining soils and in the San Joaquin Valley to subsoil layers of clay above which irrigation drainage pools.

The primary solution, developed in the Imperial Valley, is emplacement of tile drains to carry away the brine. That solution also works in the San Joaquin Valley, where rising water tables are causing yields to drop sharply on 150,000 acres and could affect about one-third of all irrigated acreage.

Disposal of the brine, however, once removed from the field, is a further problem. The Imperial Valley discharges it into the Salton Sea, which is rising as a result. The San Joaquin Valley lacks such a sump. Evaporation ponds are one solution; they might occupy more than 100,000 acres of present cropland. Another solu-

tion, the Valley Drain, would carry wastewater to the inland end of the San Francisco Bay; this proposal is controversial, especially since the discovery that some of the drainage water contains selenium.

Water costs and overdraft

The cost of water to agricultural users is rising in most areas, for several interlocking reasons. Major water suppliers like the Central Valley Project are raising their prices, and new dams and aqueducts will be very expensive. Groundwater pumped from aquifers is also becoming more expensive because of overdraft: when water withdrawals exceed recharge, groundwater levels decline, increasing the energy cost of pumping to the surface. Agricultural overdraft statewide amounts to about 1.8 million acre-feet per year, 1.2 million of which occurs in the San Joaquin Valley.

In a few isolated areas where groundwater has become very expensive to pump, the lack of affordable water may actually result in land going out of production. In much wider areas, rising costs are likely to bring about changes in cropping patterns, with unclear consequences.

A specialized water problem occurs in coastal areas where groundwater overdraft allows seawater to intrude into partly emptied aquifers. An unknown acreage is threatened; the upper limit would be 230,000 acres, with the real figure probably a fraction of that.

New irrigation and technology

In the past, production capacity that was lost when land was urbanized or physically damaged could easily be replaced by bringing new lands under irrigation and by increasing per-acre yields. Because the water supply is limited, however, continued expansion of irrigation may be near an end. According to AFT's survey of agricultural experts in California, approximately 300,000 acres of dry land could reasonably be put under irrigation in the near future. Most of this land adjoins presently irrigated areas: around the rim of the Central Valley; adjacent to the Imperial/Coachella growing area; and in the coastal areas, where, as noted, a maximum of 10,000 acres might be add-



Soil erosion affects 8.8 million acres of California's land surface. Buildup of salt because of poor drainage (below) threatens another 1.6 million acres.



ed. Compared to the existing stock of 9.5 million irrigated acres, this 0.3 million-acre cushion seems small.

Between 1950 and 1970, innovations in farming techniques and equipment, pesticides, fertilizers, and improved plant varieties brought great gains in yields per acre. Yields are no longer increasing across the board, however, and for some crops they appear to be declining.

The trend may be reversed by the work of geneticists who are modifying plants by such new means as tissue culture, artificial seed coating, and recombinant DNA techniques, as well as through traditional selective breeding. Under investigation, for example, are plant strains that are resistant to herbicides, that can grow in salty soil, or that resist certain diseases. A tailor-made microbe may help plants endure drought. But concrete results appear to be at least a decade or two away.

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Conclusion

It seems clear that California's farmlands are diminishing in acreage, when rangeland as well as cropland is counted, and that some of their potential productivity is being lost. In one strictly limited, highly productive area, irrigated cropland in the maritime climate belt, the loss is of immediate concern. This case aside, it would be wrong to speak of crisis, but it is clearly appropriate to take steps to ensure that the richness of California's agricultural land resource is permanent.

Two comprehensive reports published in 1986 identify several possible steps: the American Farmland Trust study of the agricultural land base, published under the title *Eroding Choices/Emerging Issues*, and the State Department of Conservation *Soil Conservation Plan*, prepared by a citizens' Soil Conservation Advisory Committee working with Department of Conservation staff.

The two reports have many recommendations in common. Both put a high priority on basic research and mapping and on sharing what is known. Both emphasize educational programs and modest incentives to improve agricultural practices. Both propose a lead role for the state but would rely on other existing agencies, including the Resource Conservation Districts that cover most of California, to do most of the implementation.

The American Farmland Trust report also recommended that the state:

- Provide funds to the USDA Soil Conservation Service to accelerate its statewide soil surveys, now scheduled to be completed by the mid-1990s.
- Print and distribute the Important Farmland Maps now being prepared by the Farmland Mapping and Monitoring Program of the California State Department of Conservation.
- Provide information and technical assistance to local governments and landowners on farmland conservation techniques.
- Require Local Agency Formation Commissions to give higher priority to farmland conservation when considering



If the present rate of conversion of cropland to nonagricultural uses continues, an estimated 900,000 acres that were used to grow crops in 1980 will be "under cement" by the year 2000. The conversion is especially rapid in California's prime coastal areas.

incorporations, annexations, and spheres of influence.

Establish a state policy on the conservation of agricultural lands that would regulate state actions affecting farmland.

Assist directly in the preservation of individual parcels by compensating landowners who agree to forego future non-agricultural development.

Separate proposals in the Soil Conservation Advisory Committee report were that the state:

Create a permanent state advisory committee for soil conservation policy and programs.

Establish an Office of Land Conservation within the Department of Conservation to develop and implement soil conservation programs.

Study and recommend local implementation measures for soil conservation programs: for example, strengthen resource conservation districts.

Establish an ongoing inventory of California's land and soil resources in cooperation with local, state, and federal government agencies.

At a time when a surplus of several farm commodities exists, it may seem quixotic to work to maintain the farmland base. The current economic situation is not permanent, however; the loss of farmland, for all practical purposes, is. Even after strong protective efforts are undertaken, the farmland base will probably continue to shrink for quite some time. This may be the time to begin taking control of the situation.

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