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## Resources could change California's agricultural future

For its own stability and well being, a society or an industry must have a continuing concern for the future as well as an understanding of the past and an orientation to the present. The ultimate limits, and indeed the nature and structure of California's agriculture, will be determined in large measure by the future quality, cost, availability, and utilization of two essential natural resources.

Whether we long for the "good old days" or look forward to growth and progress, the fact is that a technological enterprise like California agriculture depends on readily available supplies of energy and water resources. The potential for conflicts of values and interests related to water and energy use will be particularly acute in California, where urbanization and population growth are significant factors.

As multiple demands outstrip the supply and escalate the cost of water and energy, the ability of California agriculture to sustain its present diversity and number-one ranking in value of products produced, or even its ability to survive economically, may well depend on public policy decisions concerning land use, water, and energy.

At current rates of consumption it is realistic to assume that within a few decades our natural gas and petroleum supplies will be sharply limited and very expensive. There are no practical alternative energy sources on the horizon that could even approach present usage levels. Because our food and fiber system largely depends on fuels, fertilizers, and chemicals that are petroleum-based, one can get a very insecure feeling contemplating the history of crude-oil and natural-gas depletion in this country, the rapidly rising rate of consumption of petroleum products, and the growing dependence on foreign sources for these products.

Even though agriculture is a relatively efficient user of energy, and its products provide food for more than 200 million Americans as well as balancing two-thirds of the cost of our country's total imported energy by means of exports, economic and societal

pressures will force agriculture to manage energy resources even more efficiently. This will be especially true for California agriculture with our dependence on irrigation and our large variety of energy-intensive cropping systems whose products must be transported by energy-consuming vehicles to distant markets. For California agriculture, energy conservation is not a slogan, it is an absolute necessity.

Many of the same considerations and conflicts of interest surface as the demands for our limited water resources increase and the costs rise accordingly. As the available water supply is curtailed or reduced and the energy to move it becomes less plentiful and more expensive, California farmers may be forced to concentrate on commodities with low water requirements and the present 200-plus commodities might well be whittled down significantly.

California's fortunate position in food and fiber production has come about largely through the application of past research as well as from a generous endowment of resources. We are now harvesting the fruits of years of substantial effort and progress in agricultural science and technology. The challenge of the future is of a new magnitude because our food and fiber prospects are intertwined with world events and resource developments. Future yields and cropping systems will depend on research underlying the conservation, development, and efficient use of our resources; how resources can be replenished, reused, and substituted for; and on research to provide a better basis for resource planning and policy formulation. For the long term, our ability to cope—our ability to meet food needs—will be heavily dependent on research findings not yet produced. Research plans and decisions made now, or the lack of them, will therefore affect our prospects and our options in the future and how well our food and fiber system will be able to adapt to changes in the cost and availability of essential resources. As the rate of change accelerates and the lead time diminishes, it should be apparent to all concerned that the time to develop our research strategies to combat our future resource problems is now.