

## SUSTAINABLE AGRICULTURE IN CALIFORNIA

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Sustainable agriculture is based on the premise of working with natural processes. We attempt to understand these processes so that we can manage agricultural systems in a way that provides the food and fiber we need while conserving, preserving and enhancing natural and human resources. Conventional agriculture is dependent on large quantities of synthetic chemical, capital, energy and machinery inputs. It follows the theme of manipulation of nature -- changing nature to suit humankind.

The many economic, environmental, and social problems associated with conventional agriculture have elicited calls for new approaches to agricultural science as well as new practices at the farm level. It is suggested that by relying on ecologically sound principles it will be possible to develop practices that enhance the economic viability of agriculture while at the same time helping to improve environmental quality (MacRae et al. 1990).

In the field of science we have tended to follow the reductionist and mechanistic precepts put forth by Francis Bacon and Rene DesCartes. This method of science has also lead to many of the problems of agriculture. Systems science and holism are alternatives and complement the reductionist view of the world. Agriculture is a system and we know that systems have emergent properties and that those properties can only understood by understanding the system.

In the case of methyl bromide we have ignored or forgotten that the soil is a biologically living system. In a sense, we have declared war on the soil. We have changed its definition so that we see it as a medium to hold up plants and not much more. Living organisms are eliminated with methyl bromide, and when it is used we end up with a physical medium which is inert or dead.

An alternative point of view is to treat the soil as a living system which needs food just as humans do. That food is organic matter. Organic matter provides the food that organisms need to create healthy, living soil. Soils that have good organic matter management behave differently than soils which do not. Research in California has shown that soils which receive regular additions of carbon via organic matter have improved biological, chemical and physical properties (better soil quality) compared to soils which have not received these organic matter inputs. Methyl bromide is a short-term unsustainable approach to pest control, whereas good soil organic matter management appears to provide the basis for long-term solutions to pest control, soil quality and the sustainability of agricultural systems.

The University of California Sustainable Agriculture Research and Education Program (SAREP) has supported research that attempts to take a holistic systems view. We have also worked to enhance this approach by farmers and ranchers in the Biologically Integrated Orchard Systems (BIOS) and Biologically Integrated Farming Systems (BIFS) projects. Farmers support this whole farm approach because it provides a framework for them to actively develop holistic systems in their fields rather than being forced by regulations to change. It puts them in an active role rather than setting them up as passive resisters to progressive agricultural changes. Change is difficult. It takes time, patience and resources, and it is probably the hardest thing we do. If we want a more sustainable, healthy land and communities, we must make it easier for the agricultural community to change some practices. We can do that by supporting alternatives for them - whole systems research that they can use on their own farms.

#### Literature Cited

- MacRae, R. J., S. B. Hill, G. R. Mehuys and J. Heming. 1990. Farm-scale agronomic and economic conversion from conventional to sustainable agriculture. *Adv. Agron.* 43: 155-198.