

## **Agriculture Methods, the Environment and Human Health**

Walter Lazzarini Filho

President, CETESB-Environmental Sanitation Technology State Company, São Paulo, SP, Brazil

Honorable Dean of the Luiz de Queiroz College of Agriculture

Distinguished Faculty and Secretaries

Invited Guests and Colleagues

Ladies and Gentlemen,

I am most honored to have been asked by the Organizing Committee to present an introductory lecture at this Second International Conference on Kyusei Nature Farming. It is very appropriate that Brazil was chosen as the host country for this conference and that our Luiz de Queiroz College of Agriculture was selected as the location for your technical discussions. This occasion also marks the 90th anniversary of the founding of this institution which has become such an out-standing center for agricultural research, education and technology transfer in Brazil and, indeed, throughout the South American Region.

It is well to recognize that agriculture has been practiced in some parts of the world for more than ten thousand years. However, in Brazil it has been a recognized enterprise for less than two centuries and, I might add, has been fraught with many different problems during that time.

First, let me tell you the things about which I do not intend to speak today.

- I will not speak about the numerous negative aspects of our agriculture, but I will just mention that agriculture in Brazil has not yet been able to produce adequate food and fiber for our own population.
- I will not speak about the injustices that continue to occur in our rural areas. Even today, we still have cases of slave labor despite the fact that slavery was abolished in this country more than a century ago. Also, I will not speak of the difficulties that the rural poor have in exercising their right to own land.
- I will not describe the high risks involved in agricultural production which in Brazil seems to be such an extraordinarily uncertain and insecure venture. Also, I will not speak about the very low net return received by small farmers in the marketplace, or about the deplorable socioeconomic conditions of rural farm workers.

I will, however, speak about the destruction of our natural resources, due mainly to agricultural development and which I refer to as the first index of environment and development. This has led to extensive degradation of our environment. The best known case is the ongoing destruction of the Amazon Rain Forest. The rapid rate at which this has occurred is appalling. In just one decade (1978 to 1988) 22 million hectares of forest were completely destroyed, equivalent to a rate of 2.2 million hectares per year. While the annual rate of deforestation slowed slightly in 1989, it was still 18 thousand square kilometers or 1.8 million hectares. The result of this devastation? We now have 8 million hectares of croplands and pastures that are in a state of degradation because of improper land use and exploitive farming practices.

I would also like to mention what has occurred in our Atlantic Forest Region, a less publicized area compared with the Amazon Basin. From an originally forested area of 1.3 million square kilometers,

we now have only 150,000 square kilometers left. This means that almost 90 percent of the area has been deforested. In the state of São Paulo, we have deforested more than 90 percent of the original green cover in only 150 years.

The second index of environment and development relates to the loss of biodiversity and the extinction of species. We have compiled considerable information on this subject for the Brazilian report to be submitted to the United Nations International Conference on Environment and Development that will be held next year in Rio de Janeiro. It is estimated that there are some 10 million plant and animal species in the world today and that we are losing 8000 to 28,000 species per year, or 20 to 75 species per day!

The third index of environment and development relates to the degradation of our agricultural soils through wind and water erosion. In Brazil we lose about 1 billion tons of topsoil per year from improper land use, and the lack of proper soil and water conservation practices. After completion of the harvest, we wonder whether we should celebrate our agricultural production or if we should weep for the depletion of our soil resources. The reason is obvious. For each kilogram of soybeans produced, we lose 10 kilograms of topsoil; and for each kilogram of cotton produced we lose about 12 kilograms of soil.

The fourth index which characterizes the state of our environment and agricultural development relates to our exploitive farming methods and the concomitant degradation of our hydrologic resources. A financially poor country such as ours has often neglected to make adequate provisions for basic municipal sanitation and sewage treatment and disposal. Consequently, our rivers have frequently been used for disposal of untreated sewage. This is why the Governor of the State of São Paulo, Mr. Fleury Filho, has set such a high priority this year in cleaning up the Tietê River by preventing any further discharge of sewage effluent into this and other rivers of the Tietê Basin.

Unfortunately, agriculture is one of the largest contributors to the pollution of our lakes and rivers. Major agricultural industries in the São Paulo Region, especially sugarcane processing and alcohol production, have discharged untreated organic wastes into our rivers and waterways for years. Other agricultural enterprises such as swine and poultry operations, slaughterhouses, and flour mills also have disposed of their waste materials in a similar fashion and have contributed significantly to the water pollution problem.

The fifth index, which relates agricultural development to degradation of our natural resource base and environmental pollution, stems from the indiscriminate and excessive use of pesticides despite all of the warnings over the last several decades. The lack of adequate planning in the proper use of pesticides by our farmers and, until recently, the lack of legislation to control the marketing of these products have made Brazil the third largest consumer of pesticides in the world. Brazil spends approximately one billion dollars (USD) a year in purchasing pesticides. Thus, because of their indiscriminate use, the contamination of fruits and vegetables with pesticides is very common in Brazil. Runoff of pesticides from agricultural lands is responsible for numerous fishkills in our waterways. Studies of CETESB showed that 37 of 134 fishkills from 1980 to 1982 were due to pesticides. Residues of chlorinated hydrocarbon pesticides have been detected regularly in the milk of Brazilian women who were breast-feeding their babies.

A 1989 study by the National Research Council of the United States on Alternative Agriculture concluded that to a large extent pesticides are used to enhance the cosmetic standards of fruits and

vegetables. Often they are applied so that produce will have a better appearance of quality in the marketplace. They certainly do not contribute to the flavor or nutritional quality of foods. The result of such effort to achieve such blemish-free perfection is increased cost to the farmer, increased pesticide residues in foods, adverse effects on human and animal health, and increased risk of exposure to farm workers during application.

After this characterization of agricultural development in Brazil and the associated degradation of our natural resource base, pollution of the environment, adverse effects on food safety and quality, and risk to human and animal health, it is clear that we must seek alternatives to our exploitive and destructive methods of farming. I am delighted that this Second International Conference on Kyusei Nature Farming is being held here at Luiz de Queiroz College of Agriculture because it will discuss the very subject which can help Brazil to resolve the agricultural, environmental, and social problems that I have enumerated.

I am convinced that it is time to consider the adoption of alternative agriculture as a solution to our dilemma. The U.S. National Research Council defines alternative agriculture as a food and fiber production system that applies management skills and technological options to reduce costs, conserve energy, improve efficiency, reduce the need for chemical fertilizers and pesticides, and maintain crop yield and quality. Specific practices include crop rotations, integrated pest management, integrated crop/livestock systems, nitrogen fixing legumes, and recycling of on-farm wastes as soil conditioners and biofertilizers. Alternative agriculture also aims to reduce the need for off-farm, purchased inputs; enhance soil productivity; conserve the soil and water resource base; increase the biological and genetic potential of plants and animals; and improve the quality of life of farm families and rural farm workers.

What we are lacking most in Brazil is an agricultural policy that would encourage farmers to adopt alternative production systems such as nature farming in lieu of chemical-based conventional systems that are causing so many environmental and social problems. Such policy should not be restricted to a stimulus of agricultural reform packages, but it should focus on long-term planning over several decades. There must be a new coalition of consumers, environmentalists, agribusiness leaders, university administrators and professors, government officials, and farmers if we are to establish a meaningful and effective program in nature farming as an alternative and sustainable agricultural production system.

This means that we must make a substantial investment in research, teaching, extension and the training and development of professional workers with the necessary expertise to ensure the success of this program. The stakes are high and we must act now if our agriculture is to provide adequate, healthy and nutritious food for our people in the decades ahead.

In closing, we must never lose sight of the fact that agriculture and the environment are inseparable; they are mutually dependent and interrelated. It seems that serious problems always occur when we try to deal with each one separately while excluding the other. Thus, our challenge and responsibility not only in Brazil but, indeed, worldwide are to ensure the co-existence of sound agricultural production and development, and environmental protection and preservation, for the future of all mankind. I would challenge the participants at this conference to provide us with new guidelines and approaches on how best to accomplish this goal.

Finally, I would like to thank the Organizing Committee and especially the Mokichi Okada

Foundation, and the Luiz de Queiroz College of Agriculture, for bringing us this Second International Conference on Kyusei Nature Farming.

I wish you much success in your conference and your deliberations. I look forward to receiving your suggestions, ideas and recommendations.

Thank you very much.