COMMÉMORATION DU 250ÈME ANNIVERSAIRE

DE L'ACADEMIE D'AGRICULTURE DE FRANCE
Séance européenne
Ministère de l'Agriculture, de l'Alimentation, de la Pêche, de la Ruralité

et de l'Aménagement du Territoire (MAAPRAT), 78 rue de Varenne, 75007 Paris

Mercredi 25 mai 2011

Où va la recherche agronomique européenne ?

Which future for agronomic research in Europe ?

RETURN TO EDEN – THE ROLE OF SCIENCE IN CREATING A SUSTAINABLE AGRICULTURE FOR THE FUTURE.

par Peter **Sylwan**[1]

Facing the future. The challenges that have to be faced in future food production are enormous. In 2050 we will be another 3 billion humans on the Earth – our common home in space. Then we will need 50 – 100% more available food to affordable prices – in less than 40 years ! And this has to come from the same acreage. Globally there is not much more land to be taken into production.

Looked upon as sheer numbers this might not be a problem. We know that land farmed with modern science based farming methods is more than capable to produce 10–12 tons of grain per hectare while poor farmers in poor regions – where the food is most needed – harvest less than 2 tons per hectare. These differences in productivity are not caused by environmental conditions, but rather by politics, methods and markets.

But modern productive farming methods are not sustainable. Fossil fuel is getting increasingly expensive – and is emitting CO_2. Soil erosion and nutrient leakage are not only an unsustainable loss of valuable resources –they also cause eutrophication of rivers and lakes and dead sea bottoms. The equation that has to be solved is to find ways of increasing production and at the same time decrease the input of not renewable resources, decrease or eliminate the negative impact on surrounding eco systems, raise the quality of food produced, increase the profitability of farming and stabilize the price of food to consumers.

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This equation can only be solved by the help of science and a much deeper understanding of the fundamental mechanism of natures own way of using energy from the sun to transform gases in the air, water in the rain and salts in the soil to usable matter. Nature's own capacity to transform sun, wind and water to dry matter sometimes compares to and exceeds what even the most productive farmer can do. And does so without any ploughing, sawing, fertilizing and spraying, and without any soil erosion and leaking of nutrient that destroy surrounding ecosystems – and has done so in millions of years. The challenge for modern agricultural scientists is to reveal the fundamental and sustainable biological mechanisms of nature and transform them into usable knowledge, plants and technologies for food, fibre and energy production.

But scientists, experts and farmers also face another challenge. New and deeper knowledge of nature's own methods and mechanisms – and transforming them to valuable cultivars and sustainable technologies – can only be achieved by using the tools of modern bioscience. And at least in Europe there is a significant public and political resistance against the use of modern biotechnology in agriculture and food production. The sustainable seeds of modern bioscience can only be grown harvested if scientists, experts and farmers understand the reason behind the resistance and use their science, expertise and farming in ways that meet the need of the consumer and serve public goods. The road ahead follows the E 5 of Empathy, Ethics, Esthetics, Ecology Economics.