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ECLAIR- COOPERATION BETWEEN AGRICULTURE AND INDUSTRY THROUGH BIOLOGICAL RESEARCH AND DEVELOPMENT-

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ECLAIR - Cooperation between agriculture and industry through biological research and development.

Certain familiar foodstuffs, such as beer, bread, cheese and wine, are prepared in a tradtional and biotechnical manner. It is mainly during the last few years that various scientific discoveries have enabled us to better understand the function of cells and living systems, so that we are, today, able to differentiate the biological processes.

Modern biotechnology gives a new dimension to the classical methods of work used in microbiology, as well as to crop growing and cattle raising. The use of enzymes and micro organisims has revolutionized the chemical and pharmaceutical industries, and has opened new perspectives for us in the exploitation and valorisation of natural raw products.

The biology of tomorrow is already on our door-step. The postion our agricultural sector will take on the world market depends henceforth on the efficient cooperation of industry, agriculture and research.

The European Community has for years supported Research and Development programmes in biotechnology. Based on the rapid progress made in this field and, in particular, on the success of the community research programmes, the ECLAIR project (abbreviation of European Collaborative Linkage of Agriculture and Industry through Research) is an EC programme of five year's duration aimed at putting a new phase of scientific policy into concrete form.

What will be ECLAIR's task? Brussels sees in it the opportunity for agriculture and industry to cooperate more closely than ever through biotechnology. ECLAIR should accelerate the practical application of results obtained by the scientists to agriculture and industry.

The United States, as well as Japan - our principle competitor-

have drawn up efficient long term programmes to develop marketable products which do not come from the foodstuff sector ot from vetetable fibres. Although Japan is less extravagant than the United States or Europe, the policy of development which it has been conscientiously following for more than ten years, has ensured Japan a firm position on the European market in the particularly interesting sectors of the bio-industry, such as the manufacture of anti-biotics and amino acids.

Europe finds itself in very favorable conditions for the creation of a profitable agro-industry. We have the advantage of a high agricultural productivity, a capacity for varied high quality research and an industrial sector willing to cooperate.

Our worrying surplus foodstuffs bring about deficits for agriculture which eat up some two thirds of the budget of the EC, whilst blocking other essential tasks. In order to safeguard the familial character of agricultural exploitation, it is not sufficient simply to limit production. Other alternatives have to be found which do not lead to the deadlock of surpluses. These surpluses of agricultural production are in direct opposition to the importation of cheap raw materials which meet industrial specifications. Oilcakes, notably, (soya based, for example), mineral oils containing specific fatty acids (cocnot oil and palm oil) and more than half of the products used by the timber industry are imported from third world countries.

More and more, it will be possible to obtain organic substances based on biological substrata and no longer derived from oil. Conversion to these new techniques is nevertheless slowed by the current low price of crude oil, together with the economic uncertainty linked to most biotechnological methods. It can, neverthless, already be foreseen that the raw materials

of European origin will be able to offer at the same time good security and open vast future perspectives

Scientists need to be in contact with specialists in economy in order to add their contribution to the cooperation between agriculture and industry. Indeed, the practical application of discoveries resulting from research is far overdue. Another problem lies in the fact that, if it is certain that Europe has excellent researchers available, no one country has individually all the specialists and all the research facilities required to reach the "critical mass" which is indispendable for the complete exploitation of the biotechnological possibilities.

ECLAIR should help in facilitating this passage from the theoretical to the practical. This programme coordinates the activities and can only bring them to a successful conclusion if all the knowledge and all the potential of member states are pooled.

ECLAIR will be of service to the following economic sectors:

- Agriculture (in its widest meaning, including silviculture, aquaculture, etc.)
- the agricultural supply sectors (plants, cattle, grains, embryoes, manure, fertilizers, phytosanitary products, weed-killers, vaccines and veterinary medications, machines and tools, advisory services ...)

- industries involved in production, treatment and transformation of agricultural products (foodstuffs and drinks, fermented products, chemical and pharmaceutical products, technical oils and greases for lubricants, detergents etc., wood and ligneous products, paper and cardboard ...)

The Community bears 50% of the costs of the project, the

remainder being pricipally borne by the industry. This undertaking was foreseeable; the Community also guarantees that the development of new products and new treatment methods will take into account the considered economic factors. ECLAIR SUPPORTS Research and Development on a precompetitive basis. The results of the projects will encourage the participants, industrials and others, to take themselves the necessary steps leading to practical commercialisation.

In particular, it is hoped that small and medium sized business will participate in this programme, for they very often constitute an important innovating force for the economy.

ECLAIR includes three levels of activity, its projects rely on the most recent biotechnological acquisitions:

1. Agricultural products which will be treated by industry

The efforts made will aim at adapting the quality of agricultural raw material as exactly as possible to the needs of the post-treatment industries. On the one hand, it will be necessary to improve the traditional products and, on the other, to develop for agriculture other production alternatives which will not clash with an oversaturated market, but which will offer, on the contrary, new outlets.

Let us quote, for example, the development of vegetative flax (resistance of fibres, sowing yield), sun-flowers (higher content of oleic acid), rape-seed (rich in erucic acid) and soya (adaptation to central European climate).
Development and testing of selection programmes and growing techniques for plants not yet cultivated in Europe such as cuphea and euphorbia (providing specific fatty acid) could be envisaged.

The project will play an essential role in the field of cattle

feed, by enabling a study to be made of the appropriateness of the raw materials and to develop new improved fodder. They could for example, aim at obtaining better disgestibility or a higher content of vital substances (essential amino acids etc

II. Industrial Aspects

Here it is a question of the industrial sector located up-stream or down-stream from agriculture.

At the level of the former, it is necessary to search for exploitation, auxiliaries and methods which would enable productior to be at the same time more economical and above all more ecological.
In a specific manner, the development and testing of totally biodegradable phytosanitary products with specific spectrum could be envisaged. Other projects could exploit the recent discoveries and acquisitions in microbiology to improve the feeding of plants (stabilizing nitrogen in the air, mycorrhiza) according to the level of nitrogen, phosohorous and trace element for vegetables, cereals, bushes and trees. An important element lies in the better exploitation of manure so as to reduce loss caused by leaching and reduce the contamination of surface and underground water.

As far as the industries situated up-stream from agriculture are concerned, it will be a question of modernizing the traditional methods of treatment and developing new methods of preparation and new fields of application (erucic acid, for example), with a view to profitably exploiting the traditional raw materials (such as flax, colza, the starches and alternatives. Sugar and starch represent large sectors of agricultural production and can be treated in very diverse ways. The amylases, for example, could supply a new totally biodegradable packaging material. The generalized use of this type of

material would represent a considerable progress for the protection of the environment.

III Integrated Methods

This theme with multiple sides englobes various integrated projects in the agro-industrial sector, such as total harvesting, or the introduction of the most recent computor techniques into agricultural exploitation and the checking of the processes.

Total harvesting consists in harvesting and using the plant in its entirety without any wastage. It could be envisaged that for a specific plant, a possible new variety, a specific growing and harvesting method be developed. The harvests of several farmers would be transported to a centralized preparatory intallation, where they would be separated into their different usable components (for example, into stalks, leaves and grains) which would be immediately treated.

The application of modern technologies to agriculture incorporates above all an intensified use of computors for processing data, as well as recourse to mechanised chains commanded by computors in order to rationalize production to a maximum.

All these projects stem from a policy which forbids them from having a detrimental impact on man or the environment, and any proposal susceptible to inhibit or suppress a cause of pollution would be particularly welcome.

ECLAIR represents a step taken by the EC to modernize the agro-industrial sector in the medium and the long term. A better diversification of agricultural production can help to elminiate the surpluses and advantageously replace the importation of raw materials whilst ensuring supplementary outlets. A better rationalisation and lowering of production costs in the agricultural field will, in addition,

enable the incomes and the security of the rural agricultural exploitations to be increased.

The Programme aims deliberately at convincing industry of the advantage of regenerable raw materials and at enabling the most recent discoveries in the field of biology to be applied to work methods in order that agriculture may progress to an indispensable next stage towards the future.

ECLAIR constitutes one of the means to have agriculture and industry cooperate more closely. It is perhaps a first step towards a healthy economy, capable od being responsible for itself without any subsidies whatsoever.

Perhaps the Programme will also contribute to reinforcing Europe's competiveness on the international level, so as to assure and promote its economic growth and in doing so the well-being of its citizens.