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Prospects of biotechnology application in Maltese agriculture

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SUMMARY - Agriculture in Malta has a relatively modest importance. Therefore, biotechnological applications only consist in future projects and expectations, especially in the fields of genetic resources preservation, in-vitro multiplication and forage production.

Key words: Malta - Genetic resources - Micropropagation - Inoculation - Rhizobium.

RESUME - "Perspectives d'application de la biotechnologie en ce qui concerne l'agriculture de Malte". A Malte, l'agriculture joue un rôle relativement modeste. De ce fait, les applications des biotechnologies sont exprimées sous forme de projet d'avenir et de souhaits notamment dans les domaines de la préservation des ressources génétiques, de la multiplication in vitro, et de la production fourragère.

Mots-clés : *Malte - Ressources génétiques - Micropropagation - Inoculation - Rhizobium.*

Agriculture, in Malta, has been allowed to continue to occupy a modest place in the socio-economic structure of the Maltese Islands. Agriculture contributes about 4% to the Gross Domestic Product while it employs as full-time farmers just over 2% of the gainfully occuped, as well as a large number of part-timers. This situation has been brought about by a rapid industrialization programme and by successive booms in the building industry which were sparked by the growth of the tourist industry and improvements in the standard of living of the Maltese population. It seems, however, that during this development process, agriculture has not been given its due either as an occupation or as a science.

However, there are factors of a sociological, ecological, nutritional and scientific character, not to mention balance of payments considerations, which would fully warrant revitalizing Maltese Agriculture and upgrade its role in the National economy. The application of biotechnologies seems to offer an opportunity for such an improvement, which should not be missed. In my view a conservation and breeding programme should be launched without further delay, before more losses are made to other sectors.

The adoption of such a programme must be a two pronged approach, with a differentiated tempo of implementation. First of all, as a matter of urgency, it is necessary to begin to conserve what little has survived in the way of genetic resources - mostly primitive cultivars and local varieties and breeds (but also, if any, wild species that could contribute to a significant input into eventual breeding programmes).

Such a conservation effort would constitute a small but still valid contribution towards halting the immense process of genetic erosion that has been taking place in the world, particularly in the centres of genetic diversity. A conservation programme will entail the collection, identification and recording of plant genetic material and its custody and storage "ex situ". Some, if not all, of the various operations involved could provide excellent formal and practical training for the Agricultural College students. A gene bank shall be established, in order to conserve artificially the genetic material collected, particularly of varieties and breeds in danger of extinction. Such a gene bank would have a "base collection" for a long-term storage of the material, which would not be used as a routine source for distribution, but would only be removed for regeneration when seed viability has started to decline

below an acceptable standard or for purpose of restocking items in an "active collection". The gene bank's active collection would serve for medium term maintenance of genetic material, multiplication and distribution, as well as field testing and evaluation. For this purpose the University of Malta is participating in the European Co-operative Programme for the conservation and exchange of crop genetic resources.

Simultaneously, as regards plant breeding as such, existing Government nurseries and research stations would be expanded and developed, with further emphasis on specialization, including propagation "in vitro". The Government stations' potential for providing farmers with certified planting material would thus be reinforced. Of special interest to Malta are the exciting advances that have been made recently in the development of dwarf fruit trees, which equal the yield of the established varieties while occupying considerable less space. Space in Malta is a very valuable commodity.

Another area of activity that is being contemplated for the Government experimental stations is that of organic farming. The demand for organic food is spreading among consumers in Europe and has already reached Malta. In this context appropriate field experiments and the testing and production of suitable plant varieties have been taken in hand. The multiplication of propagation material in this sector is of utmost importance and therefore the Government nurseries would have to play an active role in the promotion of this line of activity.

The limiting factor for the development of milk production in Malta is the lack of forage both in terms of quantity and quality. In Malta as elsewhere in the Mediterranean basin, legumes have been traditionally used for food and fodder production and soil fertility maintenance and improvement. Despite this, many soils in Malta are devoid of the legume root-nodule bacteria being mainly due to environmental constraints (like soil salinity, pH, and pesticides) or managerial practices of agricultural lands (rotation with non leguminous crops and introduction of new legumes). The Government stations are therefore introducing a legume inoculation service for the traditional legume crops specific bacteria. This programme includes in particular the supply of appropriate inoculants, that so far have been identified and produced elsewhere but according to local needs. Eventually, a Rhizobium bank must be developed in order to guarantee the preservation of local strains and their use according to requirements. This would help to the development of milk production by improving the supply of good quality forage. It would also contribute towards the attainment of the targets of the National Nutrition Policy aiming at an increase in the consumption of edible legumes at the expense of fats.

This is in short Malta's modest initiation in biotechnology. I do hope that such approach is correct and I would welcome any comments on this approach. Being an island and very small, Malta is substantially free from dangerous pests and diseases. Due to this biotechnologies must be directed towards productive development which is still lacking.