ABSTRACT

the habilitation thesis „Sustainable horticultural systems for environmental protection and food security",

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Key words: horticultural plants, sustainable horticulture, soil conservation, environmental protection

In this abilitation thesis with the title " Durable horticulture ecosystems for environmental protection and alimentation security" I have presented the most important scientific, professional, achievements food on interdisciplinary themes directions. These were documented by consulting with the publications links facilitating thus its verification. Personal achievements were presented in the context of actual stage of scientific research in the horticulture field with connections in areas such: durable horticulture, alimentation security, soil conservation and environmental protection, as well as renewable energy pointing out in a documented and argumented mode, relevance and originality of personal contribution.

Alternative agriculture with all its branches as well as horticulture are need to be a "living system" of the ecosystem type, example and its model being its nature itself.

Piloting of some ecosystems, assumes a new scientific endeavor, which is named " environmental engineering" or " ecosystems engineering" which builds new internal relations between Environment and Economy, balanced relations between the ecosphere and tehnosphere, having as a study objective natural resources and pollution with its economical implications.

By applying principals of production systems in alternative horticulture we pursue: maintaining soil fertility, environment protection, respect towards the health of the consumers, etc.

Another objective of the research activity was the evaluation of production and quality performance of new varieties of horticultural plants (vegetables and fruit trees) with the purpose of actualizing assortments for the south part of Romania.

The variety is defined by a group or distinct population, stable and unitary of individuals with common origins and specific ecological adaptation.

The varieties are integrated in the assortment composing a structure which, in different stages, represents the biological support of the fruit production. Thus the variety and the assortment have a continuous historical evolution.

From another point of view, of the economical efficiency, the variety discerns as an important production method: in equal conditions of the environment, variety with higher genetic resources always assures productions and superior quality.

The assortment by its component varieties it is in a continuous dynamic. It improves and evolves permanently, slower or faster depending of needs and exicengy of society.

Continuous degradation of the soil as main component of the environment and significant extension of the degraded and polluted soil, imposes elaborating and implementing of friendly measures with the environment regarding degradation prevention and efficient utilization of resources available of the soil.

Because soil resources are very heterogeanly, Romania being considered a natural museum of soils, I consider that elaboration of amelioration technologies and durable exploitation of soil resources can be achieved only through the basis of local attributes of weather, soil, landform.

Land degradation is to a major problem of the XXI century because of its negative impact on agricultural production, on the environment and its effects that are produced on alimentation security and quality of life. Land valorification with excess of water depends on the differentiation of causes which determine soil degradation and its effect produces on plant varieties and culture technology. Techniques of prevention and control of excess water are presented but also specific technologies favorizing draining excess water by the elements of the hidrotechnical scheme of the main arrangements for the drainage.

Sustainable exploitation of sloped fields have as main impediment hydric erosion. For the ecological reconstruction of degradation produced by these fields basis problems must be acknowledge regarding erosion producing with its different forms of manifestation and specification of appreciation indicators of intensity of these processes.

Food security is a major challenge of agriculture and human alimentation of the XXI century in general and implicitly of urban agriculture.

To make possible food security without bringing other damages to the environment must be imposed, promotion and implementation of sustainable agriculture.

An important component of food security is that of fruit consumption especially the ecological ones, which bring in its contribution a healthy diet and can help prevent at the amelioration of micronutrients deficiency or degenerative diseases.
In the last years antioxidant activity of diverse vegetative sources was intensely studied. It is currently looking for unexploited sources of vegetable rich in bioactive compounds but also more complex methods of quantifying both hydrophilic antioxidants and lipophilic.

Mainly, these biological activities(antioxidant and antimicrobial, anticanker etc.) are due to secondary metabolites. Finding some vegetative sources with high content in bioactive compound or establishing technologies which can harness these compounds, with applicability in the food sector, will have as effect the improvement of the quality of life from a point of view of maladies preventions.

In accordance with the European Community, Romania appealed to detection of main resources of available biomass for the replacing of some conventional energetic resources.

The wish of realizing biofuel by utilizing technical plants makes the important surfaces of agriculture fields fated for food production to be immobilized for the production of technical plants regarding obtaining biofuel.

In this respect we have tried to establish the main components of lignocellulosic biomass resources in the idea of getting a viable technology for their exploitation.

In the context of important assurance of environmental protection, the group of methods of separation through adsorptive bubbles, which includes dissolved air unconventional flotation, represents one other alternative to treating levigates from sewage treatment plants.

Water pollution with heavy metals is another reason for concern at the global level because of its negative effects on human health and ecosystems. Absorption has been proven to be the method of accepted treatment for elimination of diverse types of heavy metal from residual waters.