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Rector's Allocution

We have the special pleasure to let you know that the Review of our University, „Bulletin of Scientific Information", having ten years of consecutive issue, it achieved the recognition of the National Council of the Higher Education National Research, being comprised in the category „National Reviews – D Category"

So, the Bioterra University review „Buletin of Scientific Information" works as a real platform for the information and exhibition of the most recent and valuable research in the agricultual field and connected sciences (food industry, agro-tourism, ecology, agricultural economics etc.). This way I welcome the contributors to our review, authoritative academic and univeritary names of whose studies are found in the selection done by the scientific board of the review.

Because this year Bioterra University celebrates 20 years of higher education and research, we invite you to participate in the International Aniversary Conference „Tourism – Agro-tourism, Strategic Components of the Organic Agriculture Development", appointed this fall in Bucharest, in the period 15-17 of October.

This way I express my gratitude to our co-workers belonging to well-known universities and institutes from all over the world, who embraced the invitation to participate in the international conference, co-workers with whom we have strong relations of partnership and mutual support in the development and course of some conjointed research projects.

I wish to the review many and consistent issues.

Prof. Floarea Nicolae, PhD
Rector of the Bioterra University of Bucharest

Summary:

ORGANIC AGRICULTURE VIABLE ALTERNATIVE OF THE FUTURE AGRICULTURE

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Abstract: *At a global scale, in over 100 countries world widely it is performed the ecologic agriculture. On equal terms as production, the ecologic agriculture it is also important to conserve the environment and to make sure that the nutritive and biological qualities of the agro alimentary products are in standards. Another overall agent it is the economy freedom of this persons and it is also taken as a priority the harmonization and facilitation of this agricultural system.*

Key words: *biologic agriculture, organic residues, crops rotation, fertilizing, humus.*

Introduction

Named also as biologic agriculture, the ecologic or biodynamic agriculture is production methods that takes into account the traditional knowledges of the peasants and integrate them with the technical development in all the agronomy fields. It is able to fully answer to the social and environment concerns, delivering to the consumers quality products, both in the rich country and the poor countries.

One of the ecologic agriculture main goals is the protection of the biosphere and of the planet resources. It excludes the use of the fertilizers, synthesis pesticides and herbicides. On the other hand, through the crop rotation, through the immobilization of the Nitrogen from the air by the leguminous, and methodic recycling of the organic residues, particularly manure or mature manure, it is considerably reduced the waste of energy: it is absorbed more solar energy and less fossil energy, that improves the energetic efficiency of the agricultural production.

In the same time, the implemented techniques from a region don't have to be implemented in other region just like that. In order to implement an agriculture being in harmony with the nature, it must learn from the biologic techniques used elsewhere, in the same time these must be adapted to the local conditions, having in view the physical and social economical conditions of the region, and optimum capitalizing the ecosystems resources.

The agro-biologists deliver desired feed by the consumers who are concerned to feed only with quality elements, without chemical residues. Supplementary the biologic agriculture, more economic and autonomous, it activates a lot of workers, building up new places of work. It attends also to the re-vivication of the villages, and for keeping the peasants in agriculture, avoiding their exodus en masse towards the urban agglomeration.

The ecologic agriculture is a type of production grounded on the soil biologic activity where are used neither chemical

synthesis products (except those tolerated through exception), nor soluble fertilizers.
The agro-biologists give a high significance to the soil care, because they consider that on the balance of this alive and composite environment depends the balance of the plants, animals and humans. Their desire is to cultivate the land and not to exploit it.
The ecologic agriculture methods are grounded on the maintenance of the alive being from the soil and particularly of the micro-flora and micro-fauna, owing to a long and varied cropping rotation, the adequate techniques, and the maintenance of a high rate of organic material in the soil. A good cognition of the soil through observations and analysis is compulsory. The farmer must have exact directions concerning the nature of the soil content in fertilizing elements in order to be able to perform the necessary alterations. The fodder harvest assigned to the livestock insert itself in a balanced rotation of the crops, the livestock's dejections being necessary for an economic and quality manuring.
These incontestable trumps of the biologic agriculture arouse a growing attention. Now it is recognized and stimulated by multiple governments from different states, and by the European Union, which standardized this way of production.
The issues of the ecologic agriculture are more complex than those of the classical agriculture, and the answers are not simple but unique. Each agricultural exploitation forms a complex system asking adapted solutions to its needs. On the other hand, significant developments have been achieved in the last years (especially in the last decade), but some techniques are not fully accomplished, particularly those concerning the weeds and the phytosanitary protection in pomiculture and viticulture.

Materials and methods

Fertilizing and nutritional needs of the plants

The fertilizing object is to maintain or increase the soil fertility and its biologic activity, especially through the organic fertilizers. The last are transformed by the soil microorganisms in humus and mineral elements that are progressively overtaken by the plants, depending on their need in the growing period.
• The fertilizing implies:
- A good knowledge of the cropping rotation with plants having different needs and, mainly, with leguminous which enrich the soil content in nitrogen;
- Administration of ground organic fertilizers resulted mainly from the stock-raising farms;
- Complementary infusion of complementary natural elements, especially of those missing from the soil. They are gradually placed to the plants disposal by the intercession of the microorganisms.
The fertilizing is tight bound to the soil farming, and cropping rotation. Some plants, as like the leguminous, have the capability to fix the nitrogen from the air owing to the symbiotic bacteria bound to their roots and, this way, to enrich the soil with nitrogen. The organic fertilizers, especially the farmyard manure, it doesn't wholly mineralize in the first year. In the balance of fertilizers with farmyard manure it has to take into account the unmineralized organic fraction. In the composite system pomiculture – cattle breeding, when the available organic stuff is used in a correct manner, the complementary mineral fertilizing is fulfilled.
• Plants nutritional needs
The plants are made of 90% water, and 10% dried stuff. They need at least 32 elements, out of which 3 limit the fertilizing

in the conventional agriculture: Nitrogen, Phosphorous, Potassium.

The carbon, oxygen, hydrogen are about 95% of the plants dried stuff. Some elements called "secondary" and the oligoelements are also essential for the plants. Among the indispensable oligoelements for plants we mention: Sulphur, Iron, Magnesium, Molybdenum, Copper, Zinc.

These must be present in sufficient quantities in soil to satisfy the plants' needs.

• Nitrogen

The nitrogen is a ground element in the plants' growth. It is basically brought in the soil by the agency of the plants that arrest the nitrogen from the atmosphere (leguminous plants integrated in the cropping rotation or used as green fertilizers), organic farm fertilizers and chalking. The nitrogen deficiency largely develops a slow growth and the yellowing of the leaves. The nitrogen excess develops cryptogamic diseases, the attack of the plants fleas and the falling of the cereals.

• Nitric nitrogen

Mark the nitrogen from nitrates. As a general rule the water pollution with nitrate fertilizers is measured in nitric acid equivalent, namely the nitrogen mass corresponding to the anion NO3 (so, 10 mg of nitric nitrogen correspond to the quantity of 44,5 mg of nitric anion). In the drinkable water the nitric nitrogen content is defined by the WHO it is 9 mg/l, being overrun in numerous regions with an intensive agriculture, particularly in the corny regions from Europe and North America.

• Phosphorous

It supports the maturation of the plants' vegetative organs and fruit and seeds development; it is an element of precocity: it promotes the ripening. On the other side it increases the resistance against diseases and drought. The phosphorous deficiency slow-down the blooming, it yellows the inferior leaves, and color in dark red (purple) the others.

• Potassium

The potassium concurs to the plant metabolism regulation, and it interferes with photosynthesis, favoring the increase of the sugar and starch content. The potassium deficiencies exhibit a yellowing of the leaves beginning from the edges, followed by a blackening between the nervures. The excess can induce a magnesium block.

• Calcium

The calcium helps for the pectin's development that provides the plants rigidity. It favors roots development and ripening of the fruits and seeds. The soil pH is connected by its calcium content. A fertile soil must by adjacent to the neutrality (pH=7). An excess of alkalescency can disturb the assimilation of phosphorous, magnesium, iron, and other oligoelements. The re-equilibration of an acid soil is performed to a supply of chalking.

• Magnesium

The magnesium fulfills different basic actions. It interferes especially in:

- Fecundation;
- Development of fruits and seeds;
- Increasing the vegetative content in A and C vitamins;
- Improvement of the soils structure and increasing of the pH in the chalky;
- Assimilation of phosphorous;
- Stimulation of the nitrogen fixing bacteria activity;
- Leaves protection against pests and diseases;
- Improvement of the antagonism to drought.

• Oligoelements

The oligoelements are chemical elements indispensable to the life, but they are in a very low quantity in the vegetal and animal organisms (the plants contain oligoelements in proportion of at most 0.05%, dry stuff).

The oligoelements have a fundamental function for the plants, in the normal physiologic action at the cell level, a function less known for some of them. The main oligoelements are: magnesium, iron, silicon, zinc, rubidium, copper, bromine, tin, manganese, iodine, born, arsenic, cobalt, and lithium.

Fertilizers in the biologic agriculture

• Compost

In the biologic agriculture instead of the manure concept it is preferred those of fertilization, because the main goal of the nutritional input isn't only the direct nutrition of the plants like in the case of the conventional agriculture, but also the soil enrichment. By the mediation of the soil moistening process and the activity of the microbial population, in the biologic agriculture it is provided the whole range of nutritional elements necessary to feed the plants, and they reduce the pollution risks of the deep waters.

Due to the increased solubility of the synthesis chemical fertilizers, it is provided a plants' rapid growth, as a main effect, but with a series of collateral unwanted effects. One of the most severe effects of this chemical fertilizers use occurs due to the rinsing phenomenon of the nutritive solution from/on the soil by the irrigation water or rains, and its infiltration in the underground waters, contributing to the acceleration of the eutrophysation process of the water course.

Another phenomenon, occurred due to the infiltration of the excess chemical fertilizers for the plants over-feeding, it is that of parasites proliferation on animals and plants, as like: flies, red spider, Oidium Tuckeri and Botrytis, of those development is accelerated at the crops excessively fertilized with nitrogen. For these reasons in the biologic agriculture it is preferred the use of the organic or mineral fertilizers where the hardly soluble nutritive elements are mobilized with the help of the soil microorganisms.

Getting the Compost

The main land enrichment used sources in the biologic agriculture are represented by the aggregate vegetable residues (stubble, remnants of corn, potatoes, remnants resulted from the trees maintenance etc.) mixed in an adequate ratio with organic fertilizers, mainly stable manure or matured compost.

The embedment in soil of the obtained material it is performed with the tillage at 25-30 cm. this practice is less expensive to reintegrate the organic stuff and for the recovery of the natural soil fertility, because through the stimulation of the micro-flora activity it is. Getting the compost is the main ground of the soil fertilizing. It can be get compost from a permanent livestock layer, using both the solid part of the animal dejection and the urine. It can be composed every not-pollutant organic material, existing in the farm: manure from cattle (the best), ovine, horses, chicken, vegetable scraps such as: straw, hay, grasses (before the seeds emergence), remnants from the trees maintenance, grape vine shoots, wool staples, chicken barbs, wood ash, remnants of fruits and vegetables. In order to get a good quality compost it isn't enough the order less use without any criterion of any organic material, but the supervision of the composting process, depending on the size, humidity, structure and composition of the residual stuff, so that compost be rapid and efficient available to the microorganisms, being an ideal and rich substratum in nutrients for their development.

From those above mentioned, it result the

fundamental significance of the relation between the carbohydrates content (more exact, carbon), and that of proteins (more exact, nitrogen), the used materials for composting. Optimum conditions for the microorganisms' activity are provided when this ration is between 25 and 30.

When the material used for composting is richer in carbohydrates and their by-products, the microorganisms have major difficulties in decomposition of the organic remnants, and thus it will be necessary a longer period for the compost maturation, in this case poorer in humus. When the material used is very rich in proteins and their by-products, it takes place a nitrogen excessive failure, especially in ammonia.

• Mode of action

In order to get a good quality compost it is necessary the utilization of a mixture of stuff rich in carbon (straw, sawdust, turf, paperboard, lives of lime, beech, oak etc.) with some having a high nitrogen content (vegetable remnants, dried blood, manure etc.), so that it is provided a good penetrability.

As every biologic process, for getting the compost a special significance must be given to the moisture degree of the composition. The materials to dried (cover, bark, straw, paperboard etc.) delay the microorganisms activity, while the excess of moisture it inhibits the air flow, favoring the putrefaction process development). In order to avoid these undesirable phenomena, it is recommended to diminish the moisture of the air, and of the material rich in water and vice versa, they will be soaked the very dried materials. In other cases it is enough to mix the very dried materials with those very humid.

A very simple method to check the moisture of a mixture is the so called "fist sample", that consists in squashing the compost in hand. If after squashing result a few drops of water, the material can be turned into compost with no problem; the lack of water or water in abundance it means excess of dryness or moisture, and that has to be rectified. A significant function it is own by the good aeration at the end of the conditioning process.

The aeration depends both by the water content of the structure, and the structure, size of the used material. In this case it is necessary the careful mixture of the materials having different sizes and structures, in order to provide the optimum porosity.

In the case of a big mixture, a good aeration can be provided using some very thick drainage pipes, placed on vertical, at a distance of about 1.5 m, in the middle of the mixture. For this purpose can be used timber sticks, immobilized in the soil, which will be drawn off after the building-up of the mixture, letting tubes for the air flow. The fermentation can be achieved in silos, on traditional platforms or sections installed in opened air.

• Platform and layers

The platform it is the most practical used structured for getting the compost, being not necessary any special construction, the fermented material being stored straight on the soil in a pyramidal shape. In regard to the fermentation in silo, the platform needs more room, but the fermentation process is the usual one, and effective, because the addition of fresh material is laterally performed, without disturbing the decomposition process. Once gathered enough material for a platform, it can be initiated its stratification, performing a scrupulous mixture of the different materials.

The first layer is formed of a coarser material (branches and other residual materials, resulted from the trees maintenance), that will have the function of a natural bolter for the drainage of the excess water. Then

it follows a layer of a more refined material, and a layer of well soaked soil that, at the addition of the manure and matured compost, provides the mixture with a needed microbial load for the process. It follows up in this order, alternating the organic material layers (soil combined with animal stuffs and well moistured vegetables) with manure and the well matured compost, reaching the desired height, and afterwards the platform is covered with straw and a 5 cm thick layer of fine clay.

The lasting of the fermentation process depends on the clime, used materials, and the right setting of the platform. In general it needs about 6 months. The compost is considered matured when it turned in a friable soil mixture, of a dark brown color, with a agreeable, not pungent odor, without insects or earth worms. The shape and size of the platform have to be so that favors the aerobic fermentation process which is at the basis of the process. In general, the platform doesn't overrun a width of 2 m, and a height of 1.8-2 m. The length is established depending on the amount of materials for fermentation.

The laying out must be performed in a shady place, straight on the land. Additionally, depending on requirements, they are added nutrients so that to be rectified the effectual soil deficiencies.

• Humus

The humus is an organic material of a black or brown color, which composes in the soil as a degradation result of the vegetal and animal remnants (roots, straw, manure, green fertilizers etc.), due to some microorganisms action (bacteria, fungi), and macro-organisms (soil worms, insects, acarids etc. that compose the soli fauna: about 100,000 per m2; among them the earth worms, about 10% of the whole biomass, around 1 million per hectare ,they perform the labour equivalent with two oxen which continuously work a hectare of soil). In the soils rich in humus, the micro and macro-organisms activity is intense and favorable, that has a good influence for the fertility. In the planted fields, the humus must regenerate constantly; otherwise the soil progressively becomes poor.

Some crops give back a great quantity of remnants after harvesting: they are "humus generators", especially the fodder crops. Others absorb humus more than they give back; they are "humus consumers": is the case of the sugar beet and potatoes. A soil rich in humus has a good structural stability that considerably limits the hydro- and wind erosion. The humus is especially necessary for the fragile soils (due to their granulation), or sloped fields.

• Organic Fertilizers

Organic fertilizers increase the soil humus content, and its capability to retain water, it improve its structural stability, diminish the necessary energy amount for the soil labours, stimulate the biologic activity and deliver to the soil the major part of the nutrients and fertilizers elements necessary for the vegetation.

Organic materials given to the soil:

- Soil liming with slow evolution: manure, compost, that make stabile humus, improving the soil structure and in general fixing more than a half of the nitrogen content in the first year;
- Soil liming with rapid evolution: liquid fertilizers, solid and liquid dejections of the farm livestock, green fertilizers;
- In a limited complementarity, organic fertilizers with a rapid mineralization, birds manure, fish or meat powder, and blood powder etc.

The organic materials schematically develop in three phases:

- Decomposition in transition products by

the micro and macro-organisms;
- Partially transformation into humus;
- Transformation in stable humus.

The carbon/nitrogen ratio (C/N) is the indicative of the organic material given to the soil. The optimum balance is between 10 and 12. When it's higher, the organic materials are less available to feed the microorganisms.

• Fermentation Activators

In order to accelerate the beginning of the fermentation process, if the case they are added a very little quantity of activators. These are:
- Ferments consisting in extracts of plants, de bacteria or enzymes;
- Preparations grounded on silica (SiO2) or plants (nettle, milfoil, dandelion, valerian, and rush).

Green Fertilizers

The green fertilizers are hidden or associated crops used in the field culture, pomiculture, vegetable crops and viticulture. Their implementation doesn't cause the space losing for the main crops, because they are placed on the empty spaces (free) or associated with other plants. They are harvested either as fodder, or crushed and embedded in the soil crust. Embedded to deep the green fertilizers go through a partial anaerobic degradation, especially in the clayish soils.

Main species of used plants as green fertilizers:

a) Leguminous: bean, blue pea, cockshead, fodder pea, mash, clover. Their main feature is the fix the nitrogen from the air, and efficiently restore to the plants.

b) Cereal crops: barley (for light or chalky soils), outs (in the humid and cold regions), rye. The cereal crops are planted in general associated with leguminous in order to increase the vegetation mass, due to the favorable effect over the soil structure, and for the high enough C/N ratio.

c) Crucifers: fodder cabbage, fodder raps, white mustard, fodder beet. The crucifers have more benefits: their roots stir the soil due to their rapid development, in the same time mobilize better the mineral reserve from the soil, particularly the potassium. Even more, they grow on the poor lands, and some of them (white mustard, fodder beet) are able to control the nematodes (class of worms with thin, cylindrical body).

d) Other species: spinach and sunflower (very persistent against the draught, with a rapid development in worm clime conditions); different melliferous plants (mobilize the potassium present in the soil, and fight against the nematodes).

Cropping Techniques

a) Minimum tillage. Eventually it is performed a cultivation of soil before the planting, that favors the development of the roots. It is performed a simple superficial harrowing to embed the seeds. The roots cause the deep soil mobilization.

b) An easy fertilizing. Sometimes it is necessary an easy fertilization, less for leguminous. It is used for instance manure leak. The given fertilizers to the main crop will be available for this one if the green fertilizer is embedded in soil right after the fertilizing.

c) Embedment in soil of the green fertilizers. The embedment in soil of the green fertilizers it must given a special attention. The manner they are broken up / smashed has an impact with the crop that follows the green fertilizers.

With the aim the vegetable biomass to be able to decompose in contact with the air, the embedment in soil is performed at the

surface, 5 to 10 cm in the heavy soils, 10 to 20 cm in the light soils. In order to perform this operation, the green fertilizers are broken with equipment with revolving devices, or they are cut with a special mower, provided with several cutting bars.

The brake up is performed when it is necessary a rapid decomposition, especially in gardening due to the rapid cropping rotation. The green fertilizer is mixed with soil using a harrow. It never has to be embedded through a deep ploughing because the organic material ferments, and that inhibits the root growth and it develops the parasitism. The aerobe decomposition of the green fertilizers must be progressively, and as much as possible finished before the main crop sowing, to avoid the risks of the main culture's development. The green fertilizer decomposes faster if it is tender and rich in proteins, but also when the soil is ventilated through cropping techniques.

The embedment period of the green fertilizers is determined by the subsequent crops, clime, and the soil state. It must be avoid the embedment of the green fertilizers instantly after the rain, when the soil it is still humid. On the other side, the optimum stage for smashing the green vegetable mass before the embedment in soil, it must be performed before the earing for cereals, of before the first stage of blooming for the dicotyledonous. After this moment it appears the risk of seeds emergence, and thus of the self-seeding, followed by the lignifications of the green fertilizers, which causes a nitrogen blockage.

Results and discussions

Natural fertilizers in the ecologic agriculture:

• Mineral Fertilizers

These are the completion fertilizers or soil liming and not substitutes of the recycled nutritive elements. The soil liming adjusts the soil characteristics (calcium, pH etc.), and the fertilizers complete the coming organic fertilizers, bringing to the soil the indispensable elements, existing in not sufficient quantities: phosphorous, potassium, calcium, magnesium or oligoelements. The deficiencies are emphasizes through the soil analysis.

The only authorized mineral fertilizers are natural substances that didn't suffer but physical treatments (smashing, sieving). They generally must have low solubility, so that they cannot be directly assimilated by the plants; the microorganisms must solubilize them. In the same time, some fertilizers (as like the patentable) make an exception to answer to the potassium and magnesium needs.

• Fertilizers with calcareous dominance

- Sand with calcareous alga chips. It is a natural soil lime of marine origin that allows the pH increasing of soils to acid, and to enrich them in calcium. It contains calcium 30-40%, and also magnesium carbonate and manifold oligoelements (copper, iron, silica, magnesium etc.). These algae are finely-crushed before use, their efficiency depending on the fineness of the grinding, like for all the other mineral soil limes. The alga powder is directly dispersed on the soil, over the animals bedding, or embedded in compost during its preparation (3-4 kg alga per 1 ton of organic fertilizer). It is also possible through direct pulverization on leaves in order to stimulate the vegetation, and to combat against some pests. It is

preferred a gentle and fractionated use, once every two years for instance, instead a massif use every five years.

- Dolomite. This sedimentary rock, rich in calcium and magnesium, it is used in the acid or neutral soils. It profitably can replace the alga sand, especially in the region faraway from the sea.

• Phosphorous sources

- Natural phosphates. In case of phosphorous deficiency, in the acid soils it is performed the administration of the natural phosphorous, deriving especially from North Africa (Marocco) or phosphatated chalk. In the calcareous soils they are applied natural phosphate (as like Senegal phosphate, for instance). Each time, when it is possible, the fertilizers addition is accomplished through the conveyance of the compost.

- Thomas Scoria. Sub product of the metallurgic industry, Thomas scoria (or de-phosphorylation scoria) can be used in the neutral or acid soils.

• Potassium sources

- Magnesium sulphate. Deriving from the sea water's decantation, the magnesium sulphate delivers magnesium to the soil. It is used especially in the alkaline soils.

- Iron sulphate. It is added in the manure in wrac or compost with the purpose to avoid the inhibition caused by the direct administration.

• The need of mineral fertilizers is hereby estimated:

- By the soil's examination: for instance the mineral fertilizers needs are lower in the sandy soils than in the callow soils;

- By the crop examination, in order to find the eventual deficiency, diseases, or pests attack;

- By laboratory chemical analyses. In the case of an element high deficiency, the adjustment is done in manifold successive stages in order to avoid the soil unbalance. For each element incorporated in soil they are planed maximal doses. It is also taken into account the soil capability to keep fertilizing element; that depends on its clay and humus constant.

Conclusions

The techniques and methods from the biologic agriculture regard the long term preservation and improvement of the soils fertility, increasing of the soils' qualitative value where the biologic balances must be kept, non-pollutant, without pesticide remnants, the optimization of the nutritive state in the soil-plant system.

The ecologic agriculture (biologic, organic) by its nature is grounded on bio-diversity. Many of its praxis preserve and increase the diversity abundance. For instance: cropping rotation is a compulsory praxis in the ecologic agriculture; the trees, alive fund, and the crops edges keep a rich diversity of natural predators, as like the spiders, birds, and Coleoptera, that concur to the pests control. Also, only through the simple use of the organic fertilizers, they are increased the soil fertility, and the diversity of the organisms living in the soil.

Romania has the natural conditions and favorable condition for the ecologic (biologic) agriculture. Having in view the opportunities Romania has, as well as the new trends of the communitarian agricultural praxis, oriented towards a clean agriculture, the Ministry of Agriculture and Rural Development enacted the basis legal and institutional framework, partially harmonized with the EU regulations in the field, needed for the development of the supervised ecologic agriculture in our country.

The use of the biologic agriculture methods and techniques for the rehabilitation of

the agricultural lands it is sporadically at national level and actually it is implemented on limited plots, especially in the stations for research and truck farming.

Despite all these difficulties, (lower efficiency by comparison with the conventional agriculture), the ecologic agriculture begun to get room, especially in some Western European countries (France, Germany, Switzerland, Sweden an others). The biologic alimentary products carry the specification "natural product", besides the origin and other specifications. In the future the output must increase, and in the same time intensify the scientific research efforts to improve the ecologic agriculture techniques.The assessment of the ecologic agriculture results must take into account not only the economic efficiency, but also the effects with the environment, of national and universal patrimony preservation, and alimentary products' quality.

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ENVIRONMENT PROTECTION, AN ESSENTIAL ISSUE OF HUMANKIND

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Abstract: *The realities of the present show the XXI century is the time of the most complex discoveries and mutations of the human civilisation, but also with the most complex effects against life. If in the past the recovarable natural resources of the Earth were enough for the humankind needs, nowadays, following the demografic explosive enlargement, and development of all the activity brunches, the demand for the raw material and energy increase very much, and the intensive exploitation of the earth resources make more evident the major ecological unbalances.*

Key words: *environment damage, atmospherical pollution, air quality, soil protection, acid rains, climatical alterations.*

Introduction

The issue of the relation between human and environment isn't new. It emerged once with the first human collectivities, because the human was not content with the nature as it was, and it begun its transformation according to its needs.But the other side of the medal for the contmporary industrialised civilisation, of the material progress it was and it is the decay of the natural environment. Under the impact of the economical development they have been more or less polluted the soil, water, and air, they vanished or are vanishing many species of plants and animals, and the human is faced with diferent deseases caused by the pollution, occurence felt today in all countries and continents.
Their effects are felt even inntarctica. It was estimated that along a decade, the civilisation's abnormalities caused to the environment damages more significant than in a millenium. In the same time, a part of the intermediary or end raw materials, can be found in the air, soil, and water.

The acid rains are more frequent following the presence of the sulphur dioxide from the air, due to the development of the thermic process and the use of somne inferior fuels; they are removed in the atmosphere significant quantities of nitrogen, carbon oxides, carbon black, metal salts and oxides, carried by the burning gas, products having damaging effects agains the vegetation, and direct or indirect agains man.

Materials and methods

Pollution as a global issue is quite recent, more specific from the last three decades, when the world human population increased from 5 to 6 billion inhabitans. The issue studied by the researchers was in fact if it can be provided enough food for the population, and only in hte last decades they focused on an issue proved to be significant: the degradation of the environment by pollution, erosion, and other phenomenon, due to the deliverate or involuntary action

of man, process that concern not only the ability to find food but also other aspects of the human existance begining with health. So that, while the modern techniques allow to crop million of hectar of field, in the same time other million of hectars become inappropriate for cultivation, also due to the man's action.

Soil Pollution

Since man begun to fight against nature, the desert surface increased with a billion of hectars, and the process is developing very fast. Since the first primitive axe choped down the first tree, the forests lost a half of their area, while the humankind manyfolded hundreds and even tousends of times. Distruction of forests caused cataclysmal effects. The forests have an important part in fastening the substrate, relativelly thin of fertile soil, teh germinative environment of the vegetative mass. The massive clearance buried in dust blooming civilizations not only in the North-Africa but also in Asia, and in some regions of Europe caused the mountains and hills exposure until the calamity limits.

Out of the soil protection, the forest has the most powerfull purification action of the air, absorbing the carbin dioxide and giving it back as oxygen. Not less important is the forests'function as a regulation agent of the rivers course. Also, the forest is designed: to provide the needs for tourism in the conditions of the modern life, the indispensable environment for the balneary stations, the rpeservation of much more very useful species of plant and animals etc.

Nowadays it is also important the issue to provide the salubrity, as well as in the urban and rural areas, and in their neighbourhood, today the tractors ploughts sometimes dislodge plastic packings and tins, especially from the arable field near the urban areas, but also somewere else. The presence of these objects can be found in the mountains openings, along the rivers sides or seaside, everywhere the citizen gets away in the nature, whitout give up at least for a short term to its accomodations facilities, and the reflex gesture to dump the garbage.

Air pollution

The air we breathe is a part of the athmosphere, the gas mixture covering the whole globe and insure the life on the Earth. The natural ballance of the athmospheric gases which maintaned tousend of years is now threatened by the man's action through dangers as like the greenhouse effect, globale worming, air pollution, decrease of the ozone layer, and the acid rains.

One of the most important issue caused by the air pollution is the global worming, an increasing of the Earth temperature caused by the cumulation of some athmospheric gases like the carbon dioxide. Once with the intensive use of the fossil fuels in the XX century, the concentration of carbon dioxide from the atmosphere increased dramatically. The carbon dioxide and other gases, known as greenhouse effect gases, decrese the heat given off by the Earth, but without arresting the sun rays. Because of the greenhouse it is expected the global temperature increse with 1.4ºC until 5.8 ºC until 2100. Even if this trend seams to be a minor alteration, this increse could make the Earth wormer than it was in the last 125,000 years, likely to change the climatic patern, concerning the agricultural production, altering the animals and plants spreading, and inreasing the sea level.

On the other side, by burning about 8 billion tones of conventional fuel annualy it is thrown in the atmosphere about 1.5 billion tones of ashes, dust and gases. Burning the fossil fuels – coal, oil, timber, natural gas

– similar issues also make other industries, especially the chemical, metallurgic industry, some brunches of mechanician, food industry etc. – as well as the cars, plains, trains, ships running.

In the same time, there is in the world a significant accumulation of „ecologic hells", urban areas where the industrialization poisons are felt by the mixed effects: infected air, noise, overcrowding. In such places like San Paulo, Ciudad de Mexico, Detroit, Calcutta, Los Angeles, New York – the rate of the lungs decays is a few times larger, also recording different risk agents for the human health, and not only of those living in the cities. By aproaching this issue, the specialists thing that, besides the total discharge of some of them, the air recovery can be feasable with the help of the green areas. The air pollution can affect the upper area of the atmosphere, called stratosphere. The excesive production of compounds containing chloride as like the CFC used until now for refrigerators, air conditioners and manufacturing products grounded on polystyrene, exosted the stratospheric layer of ozone, making a hole above Antartica that lasts several weeks every year. As a result, the exposure to the damaging sun rays affected the aquatic and terrestrial life and threaten the human health from northern and southern area of the planet.

Results and discussion

Water pollution

Through the water pollution it is assumed the mixture in the water of some stuffs of energy forms having this kind of composition and in a such concentration that its natural features can be altered in such way the water quality is deteriorated or become grating for the sight, taste, and odour. The pollution can be described by the presence of any stuff (organic, inorganic, radioactive or biological) that incline to alter the water quality making it not drinkable or for other use.

The surface and even the ground waters are polluted because of the suspencions coming from the rocks or domestic and industrial garbage . In the same time, the sewage waters can cause:

- pollution, decreasing the use ability of the C;
- contamination, caused to the emmisary by the stuffs solved in the natural and sewage waters, altering its composition and character.

The impurification and pollution are generated by the mineral and organic stuffs, of vegetal and animal origin. The maintenance in a clean state of the natural waters, especialy in the industrialized areas, by an efficient purification of the wase waters, it represent a requirenment to provide the needed water for the industry and other consumers. The theoretical criterion is to give back the used water in the natural circuit, having the same initial purity degree. Practically it is taken into consideration some consumers requirenments on one hand, and on the other hand the self purifying ability of the natural waters.

Conclusions

The great development of the chemical industry, increasing of the industrial water consumption, as well as the increase of the waste waters volume, determined the inforcement of some pruification procedures before their discharge in the outlet, their purification has been achieved and iti si provided greatly using clasical methods, so that those initially adopted only for the house water.

The classical procedures generally offer limited purification possibilities of the used water; so they are not capable to decrease the mineral stuffs content of the water, and some damaging stuffs of organic nature, especially those obtained through synthesis are not broken by the micoorganisms. This king of contaminants stay unalterated also in the water of the outlets, being not discharged during the natural self purifying process.

The quality conditions that has to be fulfilled after the discharge of the used waters in the outlets are settled by STAS E 4706-66. These conditions must be accomplished at 1 km up-river from the using spot or area also taking into consideration the purification capabilities of the outlet.

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AESTHETIC QUALITY OF THE FOOD PRODUCTS

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Abstract: *Nowadays, we assess the achievement of quality is 80% a management problem and 20% a problem of execution. The consumers associate the note of „product quality" with what looks good, appreciating the aesthetic quality of the food product.*

Key words: *aesthetic quality, food product*

Introduction

Elements of the food products that defines the aesthetic quality:
In the comprising sphere of the goods' aesthetic, they are contained the characters of the food products aesthetic quality, which are merged with the practical utility that provides more and more satisfactions to the consumers. The scientific solution of the products' aesthetic quality position it initiates from the consideration the man and its ambient environment posses qualities and features of aesthetic nature that develops in the framework of some defined relationships.
Out of the different issues raised by the food products quality improvement, the aesthetic qualities have a significant place, probably owe to their defective approach in the food technology, and in the food literature. O the other side, the aesthetic characteristics is a precious improvement reserve for the food products quality and their development of competitive on the domestic and international markets.
In the conditions of the market economy development, the more and more exigency of the consumers mass ask for the implementation of this industrial aesthetic in the food products technology, in the framework of the two factors: product and package.
The aesthetic elements of the food products that define the aesthetic quality of the product-package system can be grouped in the relationships:
- Concerning the food product technique, by the means of the relation between shape-structure, shape-composition, shape-color, and shape-ornament.
- Concerning the look and finishing, by means of look and finishing, by means of the exterior and interior look, of the section, color, package look, products' exhibition, finishing of the exterior and interior surface, design, expression of the product, and of the trade mark, proportion and harmony.

Materials and methods

The entirety of these aesthetic elements, the taken into consideration of all elements, it removes the subjectivity in expressing the aesthetic value of the food products. It is required to underline that in frequent cases the creation understood and implemented the aesthetic elements in a more narrow vision, resuming at the exterior aspect and packaging.

Of course these elements have their significance, but the aesthetic quality of the food products cannot resume to the "attracting exterior look" or "pleasant packaging". This simplistic understanding of the aesthetic features leaded to the emergence on the domestic market of products of whose aspect was the reason of the costumers' objections. The consumers associate more and more the concept of "product quality" with that of attractive, appraising the aesthetic quality of the food product.

The development and modernizing of the food technology, the use of the newest scientific knowledge occur not only in the production area, but also in the consumption area, the request of food products progressively leading towards new products, having a high nutritive value, and aesthetic characteristics according to the necessity of satisfying all the modern needs. At these they also promote the continuous development of the culture degree, and the influence of the "Western food products" that causes a selection of tastes, demands, requests, and preference too which the consumer of the present has for the food products.

Of course, the composition of the consumer mass aesthetic abilities in relation with the technical industrial developments, it is a complex process that occurs in time and space, in each stage of the social economical development, by the absolute rejection of the qualitative non conformable and unaesthetic products. Therefore the whole developed activity from the moment of the product design until the moment when it is consumed, it has to be orientated towards the nutritive value maintenance of the sensory and aesthetic features.

The adoption of the food and package notion in the concept of physical-chemical system with multiple functions it highlights the complex interactions among different components which define in a new vision the food product concept, the fabrication receipt and technology, its package and aesthetic.

The food package and packaging is a complex part from the technical, aesthetic, and operating point of view. The package aesthetic exercises a considerable influence over the marketing action to determine the costumer to buy. So, it makes itself conspicuous the function of the package in the food products' marketing process. The achievement of some aesthetic packaging it supposes the design of some packaging with higher technical economical markers that satisfy the requests of the relation aesthetic-useful-functional-efficient.

An attracting packaging doesn't have to infringe with anything on the function it fulfills, because the beautiful is linked to the useful and efficient, allowing in the same time the positive appraisal of the food product. The packaging aesthetic is get adequately applying the plastic art elements: shape, color and design.

The shape of the packaging is in a tight dependence with the product, its shape and state of aggregation, packing material, applied technology and the correlation necessity of displaying selling-off packaging sizes with the transport encasement. For some products (tins, beverages, chicken) the shape must be chosen a manner that allows the sealed encasing and keeping the quality and integrity of the food.

In case of the used packaging for the food product portioning or for getting together f some product without a constant shape, the packaging shape doesn't depend of that of the product. The settlement of the shape and size are tightly associated to the static balance laws, to the requests of the trading companies: acceleration of the circulation speed, possibility to exhibit the food products in show windows, racks, the

racking in stores, etc. Obviously the shape choice doesn't have to neglect the necessity to save the used packaging materials, so that to be satisfied the optimum correlation shape-price.

The color is a significant aesthetic, independent, which also contributed to the achievement of other aesthetic-design elements. By its physical and psychological characteristics, the color allows an easy detection of the product, of its freshness, of the packaging and respectively of the packed food product.

the product and package through the artistic imagination of the designer who can use the photo, drawings, and suggestive text, well linked with the food nature.

For the packages it is suggested a design simple, synthetic, expressive. The illustration, design must be linked to the food product. Skillfully using the shape, the letters' disposal and color, these can transform in decorative elements, bearers of optical message, visualizing the product, and informing the consumer.

Physiologic and Neuropsychic Effects of the Colors *Table 1*

Color	Effects	
	Physiologic	**Neuropsychic**
Red	- it increases the blood pressure, - it rises the muscular tonus, - it activates the breath	- worm color - general stimulus - sensation of closeness in space
Orange	- it accelerates the heart pulsation - it maintains the blood pressure - it favorite the gastric secretion and digestion	- worm color - emotional stimulus - very ample closeness sensation in space
Yellow	- it actions the normal activity of the cardio-vascular system	- worm and cheerful color - it stimulates the seeing - sensation of closeness in space - relaxant of the neuropsychosis
Green	- it reduces the blood pressure, - it enlarges the capillary tubes	- cold and relaxing color - freshness feeling, - it favors the nervous relaxation
Blue	- it decreases the blood pressure and muscular tonus - it calms the breath and pulse frequency	- cold and relaxing color - remoteness sensation in space
Purple	- it increase the cardio-vascular strength - it increases the lungs strength	- cold and anxious, discouraging color - sensation of very intense closeness in space

Source: I. Diaconescu – Food products science of commodities

For the consuming people the colors express the most ordinary form of the aesthetic sense, these having distinct physiologic effects. (Table 1).

The sampling form the commerce it demonstrated that to a product the consumer firstly approaches the color, than the design and the drawing, and third the mark. The design completes the aesthetic description of

Harmoniously blending the shape, color and design it reached the achievement of the seduction type package, which represents a real industry a range of developed countries. In the same time, in other countries it carry on an organized battle against the false seduction package, which isn't a lasting success with the public, and in the same time it depreciates the food product.

The food product introduced in a too striking seduction package is analyzed in laboratory, and the results are given to the public by the agency of the specialty media.

Results and discussions

- But what is the essence of the quality?
- What is the factor which acts the most on the building-up of the costumer's opinion?
- The purchased product or service is f good quality?

At the complexity which it represents the definition of those terms build-up the product quality itself, for the costumers it subjoins the fact the quality doesn't limit only to the question if the product or service really represents the qualities claimed to be comprised. The quality modern concept especially emphasizes the manner how the organization complies with the costumers, including the approaching manner by phone calls, the respond speed of the personnel answering to a costumer's request, or the rapidity to make an offer (device) for a costumer or to answer to its claims.

The researches performed by the Forum Corporation concerning the reasons why it was lost a part of the custom of some important industrial and services enterprises, it shows that:

• About 15% of the costumers who left, did it because they found "a better product" (with less failures or with a lower failure index);
• Another 15% because they found "a cheaper product";
• 20% because of the "lack of personal contact and attention" from the former supplier's side;
• 50% because the "relations with the supplier's personnel were of bad quality".

The conclusion is evident: every costumer wants to get a product or service owing some minimum determined characteristics but finally the highest influence on the way of the quality perception is the manner how it is handled.

The quality from the enterprise point of view it has another shade too. For the enterprise "quality" means the adjustment of its activities depending on the manner it is defines the function the respective enterprise's leaders want the enterprise to play on the market. The enterprises leadership or the organization that operates on the market search the economic success and, from this point of view, it could be said the enterprise operates with the quality product when it gets the respective success. From this reason we can assert that to get the quality from the enterprise's point of view it implies:

- To offer attractive product for the own costumers by:

I. Identification of their needs;
II. Manufacture of products according to that requests.

- Accomplishment of profitable marketing, namely of whose prices higher than the costs.

Getting the best benefits from market efficiently producing, namely producing with minimum costs, that supposes to use the resources in an efficient manner or to avoid the losing of human resources, materials, respective the elimination of the useless actions, that don't concur to the satisfaction of the external costumer needs. We will return to quality-price correlation analysis in order to remark the quality pattern of the products and services in concordance with the price.

Conclusions

Wrong perceptions, politics, and conceptions concerning the quality:
- The governments from many developing countries, taking into consideration the difficulties generated by the lack of the international competition, and a protectionist economy, they take now decisions for some corrective actions. There is a multitude of other similar factors which rather directly concern the industry instead the market condition. These factors are very significant also including the failure in implementation of the modern leading methods, and they accentuate the short term economic development instead the long term economic development. The greatest disadvantage in the quality improvement in the developing countries however is the lack of knowledge concerning the economic benefits brought by that. The quality is approached as a desirable social objective, but it is neglected its contribution to the efficiency of the economic activities. All these are the result of a wrong conception about the quality.
- Examples of wrong conceptions:

1. The higher quality costs more.
This is the widely diffused "belief" concerning the quality. The newest valuations of the "manufacture" mechanism shown not always the higher quality costs more. It is important to understand how it is achieved the quality of a product in the modern serial production. Based on the market's requests, the quality is drafted on paper. This draft is then used for the practical achievement of the product using the corresponding production means. The investment of bigger resources in the research and development area can lead to a significant increase of the products' quality.

In the same time, through the improvement of the production process it can obtained adjustments of the overall costs per product. These facts were fully demonstrated in Japan and in the West European countries, concerning the production of industrial and commercial goods.The industry of IT, electronics and time-saving devices is a very good example; so in the last two decades the quality of those products progressively improved, and their price decreased.

2. Accentuation the quality will lead to the decrease of efficiency.
There is a widely spread wrong mentality among the production managers, namely the quality can be achieved only at the price of the quantity. This mentality is an inheritance of the time when the quality examination consisted only in a physical inspection of the end product. Therefore if in such situation entailed more exact inspection conditions, this fact usually caused a higher amount of scraps. In the modern vision of the quality inspection, the accent moved on the prevention action during the projecting and production, so that from the beginning it is removed the possibility of inappropriate products manufacturing. Therefore the efforts for maintaining the quantity and improving the quality became complementary, because the quality improvement generally leaded towards the increase of the efficiency. For instance, one of the most important activities in providing the quality is the project analysis before introduction into production. This project analysis establishes if the project is capable to satisfy the user requests. Also this analysis of the project can emphasize if the product can or cannot be manufactured with the existing means. If the case some parts of the project can be altered, so that the product can be achieved by the most economic production process.

From the above mentioned can be found the fact the activities that concern the quality, directly or indirectly cause an increase of the efficiency.

3. The quality is not affected by the manner the labour force perceive the "cult of work".
The manufacturers from the developing countries frequently complain about the low quality of the manufactured products in their countries, and they assign it to the lack of consciousness in the labor process. However a close analysis of this kind of affirmations leads to the conclusion the worker can be culpable for the products quality absence.
An objective assessment of the most manufacture units from the developing countries it emphasizes their leadership didn't make these actions at the most of the working places. In these kinds of situations, the companies must search for their weakness of the leadership systems.

4. The quality can be provided through a rigorous inspection.
The inspection was the first quality formal control mechanism at the beginning of the XX century. The most majority of the manufacturers still believe the quality can be improved only with a rigorous inspection. Only the inspection itself cannot improve the quality of the manufactured products. More than that, recent studies shown that 60-70% of the all emerged defects in the manufacturing process are directly or indirectly due to the existing deficiencies in the design, technologic and supply process. About all the quality inspection and control activities address to the manufacturing departments. It has to be underlined the fact the quality control activity isn't exclusively a developed activity by the quality department. In order to be efficient, it has to be present in the activities developed by all departments, including those responsible for marketing, design, technology, supply, manufacture, packaging, delivery, and transport. Actually the quality control must contain both the raw materials suppliers, and the costumers. It is very significant to be known and understood the costumers requests, and to get an adequate feedback concerning their perception on the received products.

5. Fulfillment of the quality requests only for the products allocated for export.
The manufactured products for export by the enterprises from the developing countries can be grouped in two large categories:
- Products of low quality appropriate for export in other developing countries;
- Products of high quality appropriate for export in developed countries.
Because in the developing countries the sale of the products is mainly performed on price basis, for the manufacturer is much easier to export in the other developing countries from the same reasons they can sell in their own countries. Anyway this approach manner cannot be applied for the export of the products allocated for USA or Europe where the products quality must be much higher. For this reason firstly they have to be modernized the exporting enterprises, so that the manufactured products are internationally competitive. In order to be successfully on the external market it is essential to have a well planed quality leading system having the aim: "zero unconformities", no matter if the products are for export or for the domestic market. In the developing countries because the life level of the locals is in a continuous increasing, soon they will be high requests concerning the quality of the products. The consumers will agree to pay higher prices for the products of a higher quality. Thus, in the coming years the price criterion will not be taken into consideration so much.

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RESEARCH CONCERNING THE INFLUENCE OF THE ASSORTMENT AND TECHNOLOGIES WITH THE STRAWBERRY HARVEST

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Abstract: *The strawberry crop had a wide development in the last 10 years due to the economic and technologic advantages of a relative simple crop. The easy recovery of the fresh fruits made the strawberry crop a passion and profitable business to. This research had the target the comparative study of some relative new strawberry cultivars, Magic, Red Gauntlet, Aiko, Pocahontas, Senga Sengana, and some aspects linked to the crop technology.*
Strawberry developed in the last 10 years in farms due to the economic and technological advantages of a relative simple culture. The easy recovery of fresh and quality products of processed strawberries made the strawberry crop a hobby and a profitable business. This survey aimed comparative studies of new strawberry varieties growing relatively recent introduction, Magic, Red Gauntlet, Aiko, Pocahontas, Senga Sengana, but also about technology culture.

Key words: *stools, remontant varieties, pollution, residuals, acid rains.*

Introduction

Nowadays, out of the fruit-growing species, the strawberry crop is one of the most efficient crops in the small agro-touristic farms with the condition of a good farm practices.
Having a low size (15-40 cm) under the compact or thin form, the strawberry can be planted in very small plots from the backyard garden, and also on large surfaces in opened air, Helios-greenhouses or greenhouses. The strawberry cultivation can also be performed inlaid the fruit trees plantations, in bowls containing mixture of soil and nutritive solutions.
In the small plots from the house's backyard, and also on large surfaces they can be planted different strawberry varieties to recover the pedologic climatic conditions given by this part of the country. This crop in order to be efficient it is necessary to be established the assortment which fits in the region and the crop technology for the maximum recovery the productive potential of the varieties and the harvest quality. This research had the purpose the comparative study of some strawberry varieties, introduced relatively recent into the culture, and aspect linked to the strawberry crop technology and pollination like: observations concerning the strawberry blooming and pollination, influence of the planting moment and biologic material quality with the rooting, and aspects concerning the strawberry' productivity.

Materials and methods

The experiment has been set up in an agricultural exploitation from Snagov locality and parallel in an enterprise from the West side of Bucharest. They have been studied 5 varieties placed in small experimental plots (15 plants in a plot, and 4 repetitions from each variety). In this sense it was found a poly-factorial experiment where the fluctuant element was the variety. The 5 researched varieties were Magic, Red Gauntlet, Aiko, Pocahontas, and Senga Sengana. The planting has been performed in rows spaced at 40 and 60 cm, and between the plants on the row the space was of 25 cm. For the research of the biologic material influence with the rooting they have been set up experiment in two variants: V1 (biologic material with a weak developed rooting system and the aerial part formed of at most of 3 leaves), and V2 (biologic material with a weak developed rooting system and the aerial part formed of at least of 5 leaves).

Results and discussion

The strawberry is an always green plant that makes difficult to differentiate the distinct cleavage of the vegetative period beginning and of the entrance in the repose period. The entrance in the repose period is difficult to define, being influenced by the temperatures level during the autumn. In a normal year considering the temperature, it has been observed that all the varieties begin the vegetation at the same level of the springtime average temperature. No matter of variety, the strawberry started the vegetative period from the middle of March.

The data from the Table 1 show the studied varieties begin the vegetative period at the middle of March during the years with worm springs, and in the last decade of March in the years with cool springs.

In the year 2008, year when it was a slowly cross from the winter to the, the air warming occurred gradual, and they were not registered late frosts, the recovery of the vegetation was early by comparison with the last experimentation years. The blossoms begin the merge after about a month of vegetative period. The fruits ripening echelon along two weeks for each variety, and among varieties are registered obvious distinctions between the moments of the fruits ripening. Concerning the growth strength of the researched varieties, we can say it is given by the petiole length and leaf blade length.

Strawberry phenophases

Table 1

SOIUL	Beginning of the vegetative period			Emergence of the Blossoms		
	2006	2007	2008	2006	2007	2008
MAGIC	25.III	18.III	12.III	28.IV	25.IV	20.IV
RED GAUNTLET	25.III	20.III	14.III	27.IV	26.IV	20.IV
AYKO	27.III	21.III	15.III	25.IV	28.IV	21.IV
POCAHONTAS	26.III	22.III	15.III	25.IV	24.IV	22.IV
SENGA SENGANA	25.III	20.III	12.III	27.IV	26.IV	20.IV

After a vegetation period it have been noticed that the strength of the 5 strawberry varieties is different. The plant height was between 25 cm (Aiko) and 45 cm (Magic).

The varieties Pocahontas and Senga Sengana had at the end of the first vegetation a plant average height of 30 cm. The leafage consisted of 5-8 normal developed leaves. Luxuriant leafage formed itself at the varieties Magic and Pocahontas, while the variety Reg Gauntlet had leafage of only 5 leaves.

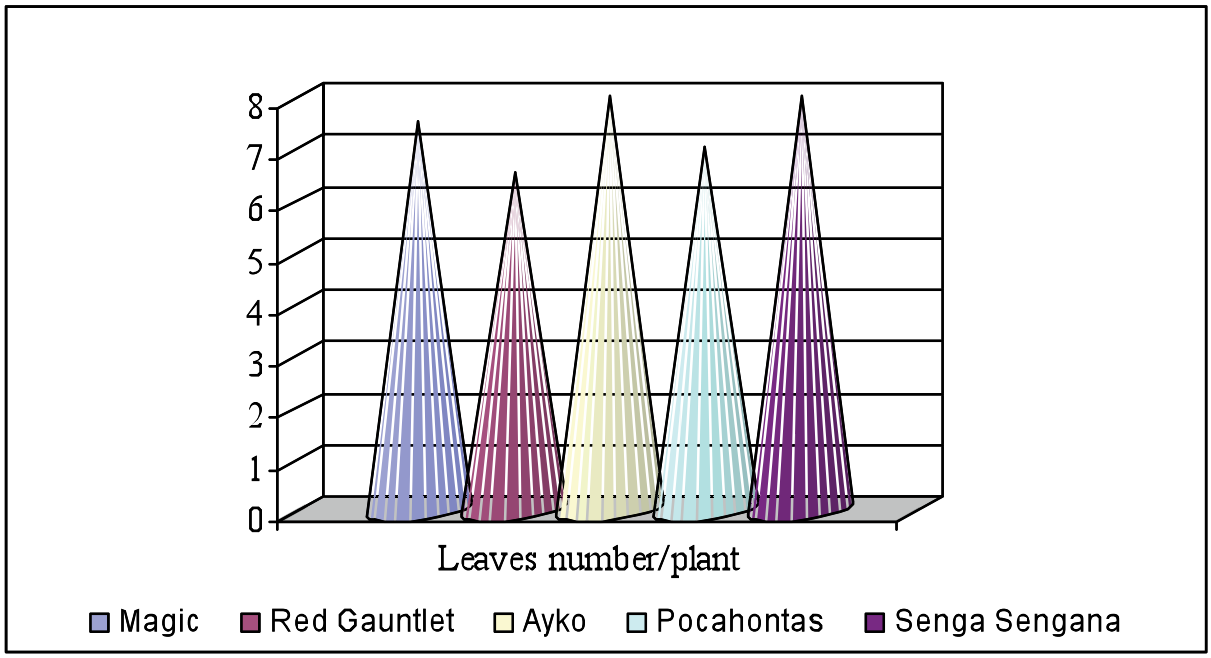

Figure 1 – Development of the leaf system

1. Observations concerning the strawberry bloom and pollination.

The bloom switches off during May with low fluctuation from one to another variety. In 2006 the opening of the first blooms from the blossom occurred on May 12 (varieties 2 and 3), and at an interval of only two days it occurred the opening of the first bloom at the varieties Magic, Pocahontas, and Senga Sengana. In 2007, due to the high temperatures from the beginning of the spring and the slow winter- spring crossing, the blossom switch off were 4-5 days earlier. So, the first blooms opened at the varieties Red Gauntlet and Ayko on May the 8th, four days earlier than in 2006. According to the variety, the blooms from the blossom (the last bloom) accomplished the blooming in 2006 at the date of 20-25 of May, namely after 6-13 days from the opening of the first bloom. Along the two years of research the blooming developed on about the same interval, meaning the blooming period is genetically defined. The Magic variety was the one which formed a large amount of blossoms. The Magic variety, which had the largest blossoms, formed both in 2006 and 2007 the highest amount of fruits per blossom. The Ayko variety formed the lowest amount o fruits per blossom. The studied varieties formed between 1 and 3 blossoms per plant.

Strawberry Blossom Time Grading

Table 2

VARIETY	Opening of the First Blooms		Opening of the Last Blooms		Blossom Time Grading (no. of days)	
	2006	2007	2006	2007	2006	2007
MAGIC	14.V	9.V	23.V	20.V	9	11
RED GAUNTLET	12.V	8.V	25.V	18.V	13	10
AYKO	12.V	8.V	21.V	16.V	9	8
POCAHONTAS	14.V	10.V	20.V	18.V	6	8
SENGA SENGANA	14.V	10.V	21.V	17.V	7	7

2. Observations concerning the biologic material quality action with the rooting rate.

In order to achieve this purpose it has been performed the stools planting framed in two biological categories: well developed rooting system (roots length longer than 10 cm), and the aerial part with a minimum of 5 normal developed leaves and low developed rooting system (roots length less than 10 cm) with maximum 3 leaves. Right from the beginning is has been noticed a clear difference between the two categories of planting material, but the research have been performed in order to find out the rooting rate of each biological category, and comparatively.

In the case of the first biological category of planting material, at the planting the roots have been cut at a length of 10 cm and the aerial part has been reduced at 3 leaves. At the second planting material category the roots were not cut (due to the small sizes), and the leafage has been thoroughly removed keeping only the central budlet. In case of the use at planting of a well developed biologic material, the average rooting of the plants of the 5 varieties was 92.6 %. The biologic material of a course quality rooted 62.8 %, 30.6 % less than the well developed biologic material. The rooting rate was intensively influenced by the biologic category of the planting material, that being 22 % lower (Pocahontas), and 41% lower (Aiko) in case of using the course biologic material. The observations concerning the influence of the planting time with the rooting rate, they were not found out significant dissimilarities.

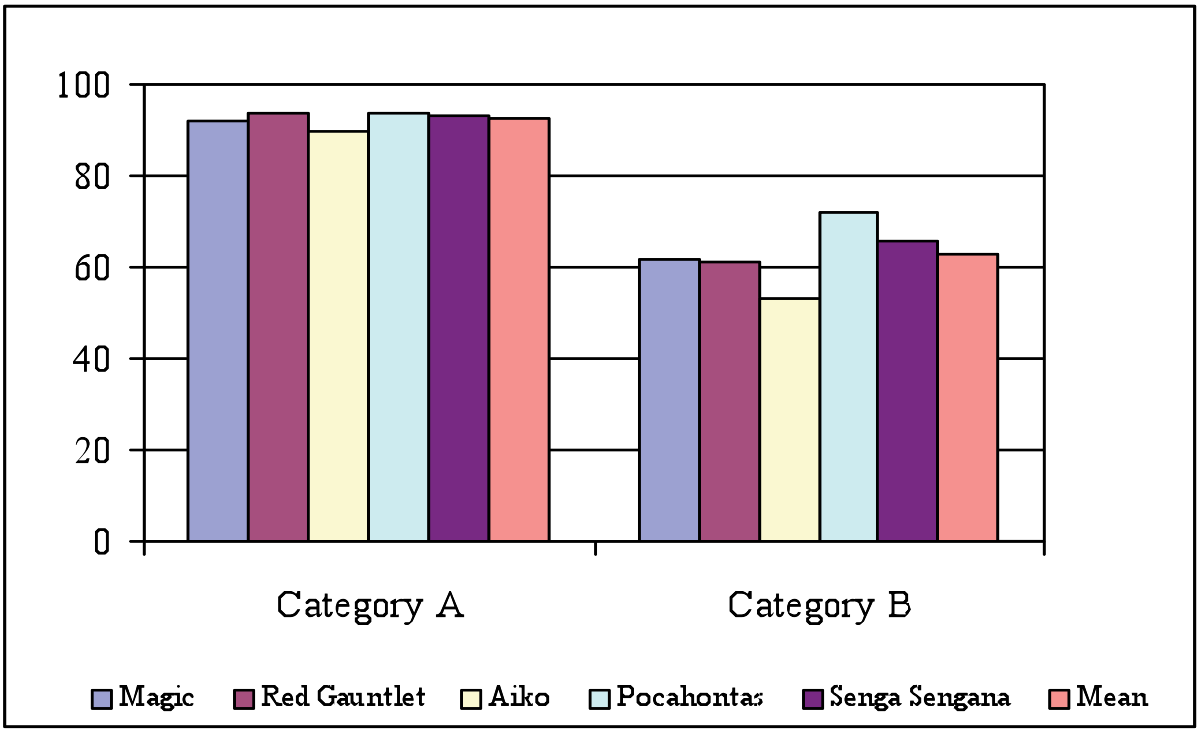

Figure 2 - Plants' rooting immediately after plantation

3. Observations concerning the strawberry's productivity.

In experimental conditions where all the vegetation agents were assured, the fruits average weight was between 17-21 g, depending of variety. The fruits mean weight out of the 5 varieties was in 2006 of 19.2 g. The fruit harvest per plant was between 170-420 g, the highest harvest being cropped from the Magic variety. In experimental conditions it is possible to get harvests depending on the biologic potential of the variety. For a large fruits harvest per area unit they are significant a series of agent like the soil, technology of culture, climatic conditions and their capability.

Conclusions

- The activation of the vegetative phenophase has been influenced by the environment conditions, in the Bucharest region the beginning of the vegetation occurring at the middle of March.
- From the morphologic point of view, the strawberry blooms shows a large diversity concerning the sepals and petals amount, and their sizes.
- Depending on the variety, the stools amount formed on a plant was between 6 and 55, among varieties being registered very large dissimilarities. The Magic variety proved to be the variety with the highest multiplication rate.
- The quality of the used biologic material had a very strong impact with the rooting rate. The coarse biologic material used for planting had a rooting rate between 53-72% compared to 90-94 % in case of the well developed biologic material.
- Among the researched varieties, the highest productive potential shown the Magic variety and the lowest the Pocahontas variety.
- The strawberry culture is a profitable crop, indifferent to the way of fruits getting, because the performed investments for its maintenance register lower values by comparison to other species, these being recovered after the first fruit harvest.

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STUDY CONCERNING THE COMPARATIVE ANALYSIS OF THE NEW HYBRIDS OF TOMATOES PROTECTED CROPS

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Abstract: *The insertion of new tomato hybrids in the protected crops is necessary because of their higher qualities compared to the old varieties. They are forwarded hybrids having varied genetic endurance against the diseases, and even some pests, providing high harvest, homogeneous fruits, and superior taste qualities.*
The new hybrids characterized themselves by good adaptability to the poorer greenhouses environmental conditions: lower light, lower temperatures in the first part of the first. The target of the research was to study some new tomato hybrids crop behavior in the condition of the cold greenhouse in order to be able to recommend the cultivation of the most valuable hybrids to the farmers who want to crop tomatoes in cold greenhouses.

Key words: *hybrid, cold greenhouse, genetic endurance.*

Introduction

The South region of Bucharest has a few areas where the tomatoes in cold greenhouses hold a high rate, concerning both the cultivated surface, and the yielded harvest. The most vexed is the assortment issue, the farmers using very early hybrids that comply for an extra-early yield, accomplished with high densities, and topping plants at a low amount of inflorescences (3-4). In sequence after these extra-early tomatoes crops, they can be accomplished subsequent crops of pepper, red pepper. Due to this kind of sequence, it is significant that the first tomato crop to leave the field as soon as possible. Having in view these reasons we assigned to try seven new hybrids.

Materials and methods

The experiment has been developed in a private farmer's greenhouses from Popesti Leordeni. As biologic material they have been used 7 tomatoes hybrids that also represented the variants of the experiment, like this:

- V0 - Cristal, check test;
- V1 - Buran;
- V2 - Rally;
- V3 - Fado;
- V4 - Velasco;
- V5 - Harmony;
- V6 - Tamaris.

The experiment has been placed in the high greenhouse, in the system of the 3 blocks with 3 repetitions. During the vegetative period they were performed maintenance works concerning the temperature

adjustment, watering, fertilizing, phytosanitary treatments, removing side-shoots, defoliation, topping etc.
They have been performed observations and quantifications concerning the growing rate of the plants in high, leaves amount, flowers amount in inflorescence, rate of fruits emergence, accomplished yield in dynamics and per total etc.

Results and discutions

The plants high growing rate has been measured through adequate measurements performed every two weeks. The results are shown in the Table 1.

Dynamics of the High Plants Growth (cm)

Table 1

Variant	Date of Measurements				
	08.03.10	08.03.24	08.04.07	08.04.21	08.05.05
V0 - Cristal (check test)	17.3	26.3	52.6	95.8	135.0
V1 - Buran	18.2	27.9	54.8	99.2	130.6
V2 - Rally	19.1	22.6	55.6	97.6	131.7
V3 - Fado	16.3	23.8	51.7	95.2	134.8
V4 - Velasco	17.2	25.6	53.8	97.3	129.6
V5 - Harmony	15.3	30.2	54.2	99.1	131.8
V6 - Tamaris	16.1	29.8	53.6	98.2	130.9

Analyzing the data from the table it is found that at the beginning of March the plant had a height between 16.1 and 19.1 cm. After April the 1st the plants growing rate intensified due to the improvement of the light conditions, and to increasing of the temperature. At the date of May the 5th the plants had heights between 130.9 cm at V6 and 135.0 cm at Vo (check test). It is found out there are not to large differences between the hybrids concerning the growing rate. After the performance of the topping, the plants reached very higher heights.

Some Characteristics of the New Tomato Hybrids

Table 2

Variant	Average height of the plants (m)	Amount of leaves between inflorescences	Amount of phases until the first inflorescence	Distance until the first inflorescence (cm)
V0 - Cristal (check test)	2.10	2.6	9.2	27.4
V1 - Buran	2.08	2.1	8.6	26.5
V2 - Rally	2.12	2.4	9.1	28.6
V3 - Fado	2.14	2.5	9.0	25.4
V4 - Velasco	2.07	2.1	8.8	27.2
V5 - Harmony	20.8	2.7	9.1	28.1
V6 - Tamaris	20.6	2.6	8.9	28.3

Analyzing the data from the Table 2.2 it is found the researched hybrids are robust reaching heights between 2.06 and 2.14m in the condition of the topping at 7 inflorescences, they have a rich leafage, amount of leaves between inflorescences was between 2.1 and 2.7, amount of leaves until the first inflorescence was between 8.9 and 9.2, and the soil – first inflorescence distance from was between 25.4 at V3 and 29.1 at V5.

Analyzing the data from the Table 3 it is found that in the first inflorescences the blooms amount is lower due to the weaker light intensity, and in the last inflorescences the blooms amount is higher because the light conditions are substantially improved. The total amount of blooms in inflorescences was between 50.8 and 55.0. The amount of fertilized fruits in each inflorescence was different from a hybrid to another hybrid.

Amount of Blooms in Inflorescence

Table 3

Variant	Average amount of blooms in the inflorescence							
	1	2	3	4	5	6	7	8
V0 - Cristal (check test)	5.9	7.3	6.5	7.3	8.4	8.4	8.3	50.8
V1 - Buran	6.4	5.5	6.9	7.1	8.6	8.6	8.2	50.7
V2 - Rally	5.7	6.7	7.8	7.9	8.7	8.7	8.2	52.7
V3 - Fado	6.5	6.2	7.9	8.3	8.5	8.5	8.4	55.1
V4 - Velasco	6.0	7.2	7.6	8.9	9.1	9.1	8.7	55.0
V5 - Harmony	6.6	6.6	7.6	8.7	8.9	8.9	8.6	55.2
V6 - Tamaris	6.4	6.4	7.8	8.5	8.8	8.8	8.5	88.1

Amount of Fertilized Fruits per Inflorescence

Table 4

Variant	Average Amount of Emerged Fruits per Inflorescence							
	1	2	3	4	5	6	7	total
V0 - Cristal (check test)	4.5	5.2	5.6	6.4	6.8	6.3	7.2	42.0
V1 - Buran	5.0	4.3	5.4	6.1	7.3	6.4	7.1	42.4
V2 - Rally	4.6	5.1	6.1	6.8	7.4	6.7	7.2	43.9
V3 - Fado	4.7	5.4	5.9	6.7	6.3	6.5	7.3	42.8
V4 - Velasco	4.3	5.6	6.3	6.4	7.4	7.1	7.9	45.0
V5 - Harmony	4.8	5.7	6.6	6.7	7.6	6.6	7.6	45.6
V6 - Tamaris	4.5	5.2	5.6	6.4	6.8	6.3	7.2	42.0

Analyzing the data from the Table 4 it is found out that in the first inflorescences the fertilized fruits amount is lower due to the lower light intensity and higher at the last inflorescences due to the improvement of the light conditions.The total amount of fertilized fruits per plant was between 42.0 at V1 and 45.6 at V5.

The highest amount o fertilized fruits was at V5 – 45.5 fruits, and the check test registered an amount of 42 fruits. Among the variants they are not very significant differences concerning the amount of formed fruits. The fertilizing of fruits rate from inflorescences is given in the Table 5.

Amount of Fruits Setting

Table 5

Variant	Fruits Average Amount of Fertilized Fruits in Inflorescence							
	1	2	3	4	5	6	7	8*
V0 – Cristal (check test)	77.5	7.1.0	87.5	88.8	81.0	82.0	87.6	82.3
V1 - Buran	79.2	77.2	81.8	87.1	86.2	83.7	87.6	83.7
V2 - Rally	82.1	71.3	80.1	87.1	88.0	76.1	88.2	83.5
V3 - Fado	73.4	69.5	78.6	81.7	80.3	76.2	87.7	81.7
V4 - Velasco	74.0	73.5	81.6	81.6	83.7	82.8	84.5	81.8
V5 - Harmony	79.0	77.8	81.8	89.9	85.7	84.6	50.0	82.7
V6 - Tamaris	77.5	71.0	87.5	88.8	81.0	82.0	87.6	84.3

**Average rate of fruits setting /plant.*

Analyzing the data from the Table 5 it is found out the lowest value has been registered at the first and the second inflorescence, and at the next inflorescences the setting of fruits rate substantially improved. The setting of fruits average rate was between 81.8% and 83.7%. Among the hybrids they are not very large differences concerning the setting of fruits rate. The registered yield was different from hybrid to hybrid (Table 6).

Annual Yield until May the 31st

Table 6

Variant	Early Yield kg/plant	Total Yield kg/plant	Yield t/ha	Fruits Average Weight (g/fruit)	Difference with the Average Yield (t/ha)
V0 – Cristal (check test)	1.02	5.20	161.2	120.6	-
V1 - Buran	0.96	5.44	168.6	118.2	+7.4
V2 - Rally	1.20	5.12	158.72	126.5	-2.5
V3 - Fado	10.8	4.90	151.9	94.5	-9.3
V4 - Velasco	1.20	5.35	165.8	110.2	+4.6
V5 - Harmony	1.30	5.56	172.3	130.5	+11.1
V6 - Tamaris	1.25	5.25	162.7	125.4	+1.5

Analyzing the data from the Table 6 it is found out the yield per plant was between 0.96kg and 1.30kg. The differences among the hybrids are not very significant. The total yield was between 5.12kg/plant at the Rally hybrid and 5.56kg/plant at the Harmony hybrid. The yield per hectare was high enough, between 158.7 t/ha and 172.3 t/ha at the Harmony hybrid, that proves the high potential of the new hybrids created and implemented in production lately. The difference between the check test hybrid and the other hybrids was of +11.1 t/ha at the Harmony hybrid and of -9.3 t/ha at the Fado hybrid. The fruits average weight was between 110.2 g/fruit at the Velasco hybrid and 130.5 g/fruit at the Harmony hybrid. The new studied hybrids characterized through a high vigor, high rate of growth, setting of fruits high rate, big and very big fruits, stable, with a great endurance for manipulation and transportation, with a very good taste, and a very lovely shape.

Conclusions

The comparative analysis of the seven new tomato hybrids for the protected culture it allows us to draw the following conclusions:

• Through the creation work of the breeders they have been created multiple hybrids that came in our country by the agency of different companies too.

• The comparative study of the new tomato hybrids it is necessary in order to be able to recommend to the farmers the most adapted ones depending on the destination of the yield.

• The studied hybrids have a high rate of growth, reaching heights of 2.06-2.14 m, they have between 2.1-2.7 leaves between inflorescences, and the distance from the soil until the first blossom was of 25.4-29.1 cm.

• The amount of blooms at the first inflorescences was lower (5.7 – 6.6), and higher at the last (8.2-8.7) due to the better light conditions.

• The setting of fruits amount was lower at the first two inflorescences due to light precarious conditions (4.5 – 5.7), but higher in the last inflorescences (7.1 – 7.9) due to the improvement of the light conditions.

• The setting of fruits rate is lower at the first inflorescences (73.0 – 77.5), but higher at the last inflorescences (84.5 – 87.6). In average this was contained between 81.8 and 83.7. They are not significant differences among hybrids.

• The early yield was contained between 0.96 kg/plant at the Buran hybrid and 1.30kg/pl at the Harmony hybrid.

• The total yield was high enough, between 15.19 t/ha at the Fado hybrid and 172.3 t/ha at the Harmony hybrid. These productions demonstrate the high efficiency of the new hybrids.

• As a consequence of the performed experiment it can be recommend the cultivation of large surfaces with the new hybrids because they have a high efficiency or big fruits, stable, with a special commercial aspect, with some antagonism to diseases and pests. They were highlighted the hybrids Harmony - 172.3 t/ha, buran - 168.6 t/ha, velasco - 165.8 t/ha.

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EFFECT OF POTASSIUM DEFICIENCY ON BEAN CROP

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Abstract: *The effect of low potassium regimes on two varieties, Nerina and Prelude, of bean (Phaseolus vulgaris) was studied in a pot experiment under glasshouse conditions. Plants of the two varieties were treated with 78, 39, 19.5, and 9.75 mg KL-1 in Rorison's nutrient solution. Nerina excelled Prelude in biomass production under varying K regimes. Of the various organic solutes measured in the present study only total soluble sugars proved to be helpful in discriminating the varieties, i.e., total sugars increased consistently in Nerina with a decrease in K level of the growth medium, whereas in Prelude they decreased significantly with a decrease in K levels. Nerina showing high efficiency for K utilisation (high shoot growth) could be of great economic value in terms of its use in soils deficient in K.*

Key words: *growth, bean, low potassium regimes, nutrient deficiency.*

Introduction

Continuous cultivation of crops make the soils deficient in important nutrients, and the crops grown on such soils show mineral deficiencies. The crops well adapted to such deficiencies can produce reasonable yield on soils of low mineral status. Owing to the high mobility of K in plants and its considerably high accumulation in the cytoplasm as compared with other essential cations, its deficiency is frequently encountered in most soils.

Crop varieties are known to differ in their responses to K deficiency, e.g. tomato, com, soybean, pearl millet. Such varietal differences may exist in other crops. Keeping this in mind a moderately salt-tolerant variety Nerina and a salt-sensitive Prelude of bean were used in the present study to investigate the effect of low supply of K on their growth and some physiological/ biochemical parameters such as chlorophyll content, soluble sugars, free amino acids, proline, and soluble proteins, with the objective that these characteristics may be affected differently with low K supply to ultimately cause differential growth in these two varieties.

The evidence available shows that K deficiency is known to perturb many metabolic phenomena. For instance an increase in soluble N and an accumulation of soluble sugars, amides and amino acids were observed in rice. Similarly, in Spinacia oleracea low supply of K in the rooting medium led to the accumulation of low molecular weight organic solutes such as amino acids and sugars. In contrast in sesame it was found that due to severe K deficiency the accumulation of free amino acids and reduction in protein amino acids took place.

Materials and Methods

The two varieties of bean (*Phaseolus vulgaris*) are Nerina (salt-tolerant) and Prelude (salt-sensitive). River sand was thoroughly washed with tap water and then

with distilled water. Forty eight pots of 18 cm size were filled with 4.5 kg of dry sand. The experiment was arranged in a randomised complete block design with two blocks, each block containing two lines, three replicates and four potassium levels.

Seeds were surface sterilised in 5 percent sodium hypochlorite solution for 5 minutes prior to experiment. Seeds of two varieties were grown in plastic Petri dishes. After about two weeks four seedlings were randomly chosen and transplanted equidistant from each other into each plastic pot.

Appropriate treatment solutions of K were applied to all the pots before the transplantation of seedlings and thereafter every week 2 litres of the appropriate treatment solution was applied to each pot to regularly maintain the K level in the sand. During the week 200 ml of distilled deionised water was applied daily to each pot to compensate for evapotranspiration loss. Plants were harvested at the onset of the flowering stage. Plant roots were carefully removed from the sand and washed thoroughly with distilled deionised water. After recording fresh weights of both shoots and roots they were dried at 65°C for one week and dry weights measured. Before harvesting the plants the following physiological/biochemical parameters were measured.

» Leaf osmotic potential

A fully expanded youngest leaf was excised from each plant in the morning at 09 h before the harvest. The leaf material was frozen for two weeks, thawed and the frozen sap was extracted by crushing the material with a metal rod. After centrifugation (8,000 x g) for four minutes, the sap was used directly for osmotic potential determination in a vapour pressure osmometer (Wescor 5500).

» Determination of chlorophyll

Determination of chlorophyll content was carried out following the method described by Witham. One gram of fresh leaves was taken from the plants and triturated in 80 % acetone. The optical densities of the extracts were measured at 645, 652 and 663 nm using a spectrophotometer (Hitachi U-2000).

» Soluble proteins

Total soluble proteins were determined as described by Lowry. 0.2 g of fresh leaf material was homogenized in 4 ml of sodium phosphate buffer solution (pH = 7.0) and centrifuged. The extracts were treated with appropriate reagents and the optical densities of the colored solutions were read at 620 nm using a spectrophotometer (Hitachi U-2000).

» Total free amino acids

Total free amino acids were determined following Hamilton and Van Slyke. 1 ml of each sample extract as extracted for the soluble proteins was treated with 1 ml of 10 % pyridine and 1 ml of 2 % ninhydrin solution. Optical densities of the colored solutions were read at 570 nm using a spectrophotometer (Hitachi U-2000).

» Determination of proline

Proline was determined spectrophotometrically following the ninhydrin method described by Bates. 0.5 g of fresh leaf material was homogenized in 10 ml of 3 % sulfosalicylic acid and the homogenate filtered. 2 ml of the filtrate was treated with 2.0 ml of acid ninhydrin and 2.0 ml of glacial acetic acid, and then with 4 ml of toluene. Absorbance of the colored solutions was read at 520 nm.

» Total soluble sugars

Soluble sugars were determined following Malik and Srivastva. 0.1 g of well ground dry material was homogenized in 80 % ethanol and centrifuged at 2,900 x g.

The residue was retained and was repeatedly washed with 80% ethanol to remove all the traces of soluble sugars. The filtrate obtained was treated with a throne reagent. Absorbance of the colored solutions was read at 625 nm using a spectrophotometer (Hitachi U-2000).

Results and discussions

Nerina had significantly (P<0.05) greater fresh and dry matters of shoots than those of Prelude at the two lower K levels (19.5 and 9.75 mgL-1) of the rooting medium. The two varieties were different in fresh and dry matters of roots in the control treatment (78 mg KL-1), but this difference became progressively smaller with the decrease in K levels. In general, root fresh and dry matter of Nerina decreased consistently with the decrease in K levels of the growth medium, whereas those of Prelude remained almost unaffected.

Leaf osmotic potential of Nerina decreased significantly (P<0.05) at 39 mgL-1 K and increased at 19.5 mg KL-1 but it remained unchanged at the lowest K level in relation to that in the control treatment. By contrast, in Prelude leaf osmotic potential was the same at K levels from 78 to 19.5 mgL-1, but a significant increase in leaf osmotic potential was observed only at the lowest K level. Although the varieties were different in leaf osmotic potential, the pattern of this difference was not consistent at varying K concentrations of the growth medium.

The low supply of K in the growth medium had no significant effect on chlorophyll a, b or a/b ratios in both varieties. The varieties also did not differ in either chlorophyll parameter due to varying K supply. K deficiency had no significant effect on leaf soluble proteins, total free amino acids or proline in both varieties, and the varieties also did not differ in either of these three variables (Table 1).

Total soluble sugars in Nerina increased significantly at 19.5 mg KL-1 with the decrease in K level of the growth medium, although a non-significant increase in sugars was observed at other decreasing K levels. By contrast, in Prelude soluble sugars decreased significantly at 39 and 19.5 mg KL-1 (Table 1). Nerina had a significantly (P<0.05) greater amount of soluble sugars in its leaves compared with Prelude at 19.5 mg KL-1.Decreasing K levels of the growth medium caused an inhibitory effect on the growth (shoot growth) of both varieties, but a more marked effect was observed on Prelude compared with that on Nerina. The differential response of these two varieties to K deficiency can be related to the early findings showing considerable variation in responses among cultivars to K deficiency in corn and soybean. The higher growth of Nerina as compared to that of Prelude at lower K levels shows its high K use efficiency.

The considerable importance of root growth in K uptake and its significant role in promoting vegetative growth in plants has been emphasized by Silverbush and Barber. A positive correlation between root growth and vegetative growth under K-deficient regimes has been observed in soybean. However, in the present study no such relationship was observed between root growth and vegetative growth in either variety under K-deficient regimes.The differential root growth in two varieties under K deficiency could be due to either differential uptake of K+ and/or efficiency in K-use, as postulated by Gerloff, although K uptake and utilization were not measured in this study.

Mean total soluble protein (mg/g fresh leaves), total free amino acids (µg/g fresh leaves), proline (µmoles/g fresh leaves) and total soluble sugars (mg/g dry weight basis) of two varieties of bean at the flowering stage in sand culture under different K regimes.

Table 1

		K-concentrations - mg-L^{-1}		
Varieties	78 (cont.)	39	19.5	9.75
		Total soluble proteins		
Nerina	1.83+0.45	1.80+0.75	2.07+0.59	1.74+0.32
Prelude	2.02±0.25	1.73±0.38	1.76±0.47	2.24+0.51
		Total free amino acids		
Nerina	87.85+4.32	81.25±2.97	72.00±6.69	77.25+5.00
Prelude	84.38+6.26	62.50+2.20	73.82+3.19	80.06±4.98
		Proline		
Nerina	2.36+0.07	2.34+0.14	3.05+0.46	2.32±0.30
Prelude	2.78±0.10	2.74+0.39	2.54+0.16	2.78+0.39
		Total soluble sugars		
Nerina	64.4+10.45 a	70.6+9.83 a	92.0+8.75 a	87.5+9.03 a
	X	xy	y	xy
Prelude	92.2+3.43 **b**	63.5±6.40 a	61.9+6.06 **b**	74.9+4.73 a
	X	y	y	xy

It has also been observed that under K deficiency translocation of photoassimilates to roots is reduced, thereby causing inhibition in root growth. This may have happened in the roots of Nerina.

Lack of any significant effect of K-deficiency on chlorophyll a and b contents or chlorophyll a/b ratios in both varieties is in contrast to the early findings of Lapina and Popov who observed that K deficiency leads to the disruption of the structure of chlorophyll and instability of the pigment protein complex. Since synthesis or destruction processes of chlorophyll have not been determined in this study it is difficult to presume that lack of effect of K-deficiency on chlorophyll content was due to normal synthesis or breakdown of chlorophyll.There was no effect of K deficiency on soluble proteins or free amino acids in both varieties and the varieties also did not differ in protein content.

These results thus do not conform with the early findings of Mitchell who found that in sesame K deficiency led to the accumulation of free amino acids but reduced the protein amino acids which take part in the synthesis of proteins. The results for soluble proteins content are surprising in view of the crucial role of K in protein synthesis, particularly its involvement in several steps of the translation process, including the binding of tRNA to ribosomes.

The only remarkable difference in varieties was observed in the accumulation of soluble sugars in shoots, Nerina being significantly higher in sugar accumulation than Prelude. The soluble sugar content of Nerina generally increased whereas that of Prelude decreased with the decrease in K levels of the growth medium. The higher accumulation of soluble sugars in Nerina can be related to the fact that K-deficiency leads

to an accumulation of soluble sugars and a decrease in levels of starch. The increase in leaf sugar content in this variety due to K deficiency can be explained that there may have been a lower demand of sugars in the sink and/or translocation of sugars to K-deficient roots may have been slowed down. Changes in carbohydrate metabolism due to K-deficiency could be related to the changes in the activity of certain specific enzymes such as pyruvatekinase and 6-phosphofructokinase.

Conclusions

The high efficiency for K utilization in Nerina (better shoot growth) is expected in view of its high adaptability under saline conditions where K uptake is considerably perturbed clue to high Na present in the growth medium. Such varieties could be of great economic value in terms of their use on soils deficient in K.

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MICROBIOLOGIC QUALITY OF THE CULINARY PREPARATIONS

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Abstract: *: Due to the fact that nowadays Romania is opened to the external markets inside the World Organization of Commerce and also by the accession into the European Union, the safety and quality of food must be aligned to the international standards and also to respect the international general rules of hygiene. The alert and modern style life generated the fast development of food technology, including here the preparation and packaging of food in order to provide the safety and good quality of food supply for the consumers. In order to determine the efficiency of the HACCP system (Hazard Analysis and Control Critical Points), the paper propose to monitor the temperature of food products served in collective restoration.*

Key words: *: HACCP system, food quality, Escherichia coli, Salmonella, food technology.*

Introduction

The most reported reasons of the morbidities due to the food are of microbiologic sourse. The germs are everywhere, and they can acces the food chain in every point. However, since the majority of the foods are not steril if they are not treated properly it emerges the contamination risk. The main described pathogenic bacteria are: Escherichia coli, Staphylococii, Salmonella, Listeria, anaerobe sulfite-reductant bacteria. The food products consumption can cause, after an incubation period (from a few hours to a few days) different symptoms: diarhea, vomit, fever, depending on the bacteria and the exposed individuals. They are affected: the litle children, pregnant women, aged or immune-defficitary individuals
The microbilogical risk is provoked by:
»Raw material or additive, can be consideres as a potential source of pathogens, toxicogens organisms, organisms that cause the alteration of make toxic stuffs (for instance the pre-formed toxines);
»Contamination sources during the manufacturing, processing or assignation;
»Loosing control of some technologic steps where the relevant microorganisms can be killed (for instance the missconduct of thermic treatments);
»Stages during the production, processing, storage, distribution etc, that offer for some microorganisms the oportunity to survive or even to develop and replicate.

Materials and methods

Not a bacteria (pathogenic or not) susceptible to be in the food does not replicate at temepratures lowar than -3ºC and higher than +63ºC. In the proximity of the optimum temperature, the above mentioned bacteria in the analysis bulletin have 10-30 minutes per generation in the less favourable conditions. The existence of the unwanted bacteria in large ammounts is generally the consequence of an initial accidental contamination of the

food, and than of the bacteria duplication in favourable conditions.
The main agents that act upon the microbial duplication speed are:
The time – the period between the obtaining of the preparate and the takeoff of the probe;
» *duplication temperature of the bacteria*.
Each bacteria has:
» a minimum multiplication temperature bellow which it doesn't multiply;
» a maximum multiplication temperature above which it doesn't multiply;
» an optimum multiplication temperature where it duplcates the most.

Results and discussion

It has:
» Fast cooling of the preparates – droping the temperature from +63°C in the thermic core of the preoduct, to -10°C must be performed in less than two hours.
» Reworming up of the preparates – from -10°C, in the themic core of the product, to +63°C must be performed in less than an hour.
» The culinary preparates are preserved at the temperature of +63°C, from the moment of preparation until the mement when they are served to the consumers.
» When the foods are cooked at a temperature higher than +70°C, the majority of the pathogen organisms are killed, and the food can be eaten in safety conditions. The foods that need a special care are the chopped meat, large joints and the chicken.
The temperature is measured with a thermometer, in the thermic core of the product. The obtained values have been statistically preocessed it is impossible to be given a sharp value for the temperature difference between the thermic core and surface temperature of the product, because it depends on the product's features: sourfaces, volume, capability to keep the heat etc.
Anyway it is possible a difference of temperature of 3°C between the thermic core of the product and the surface temperature of the product at the qualitative acceptance. It is possible to be settled the sourface temperature of the product using an infrared termometer, peculiarly for the acceptance of the preparates. The analysis demonstrates that all the culinary preparates have the temperature at the beginning and end of the wait higher than the critical temperature (Critical T0 = +63 °C), providing this manner the products's quality because the high temperature inhibits the mesophyll microorganisms replication.

Conclusions

Payng respect to the preparation, preservation, and serving temperatures of the culinary preparations, it is provided the products' quality and the consumers'safety.
The exposure dangers of the consumers changed, and the risks develop. The food chain multiply its links while the responsibility easely vanishes.

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INSTRASPECIFIC HYBRIDIZATION OF AMARYLLIS SP. FOR INCREASING THE PRODUCTIVE FEATURES

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Abstract: *The paper presents the results regarding the research on four genitor varieties used for intraspecific hybridization. The productive capability expressed by the amount of plant floral stems, as well as by the blooming dynamics as percentages of floral stems harvested on decades, and the harvested tops.*

Key words: *Key words: Amaryllis sp., floriculture species, intraspecific hybridization.*

Introduction

The Amaryllis is a floriculture species with a very defined placed in the world assortment, but slightly studied in our country. In the countries of origin from the tropical and subtropical regions of the Central and South America, the plant develops its biologic cycle depending on the local climacteric alternances, being constrained to rest in the hot and dry periods of the year.
In the areas with a temperate climate where it is planted in protected areas, at temperatures of 18-23 ° C the plant is assisted to enter in the rest period rarefying and cutting out of the irrigations until the leaves get away, and the blooming take place during the months of the winter – spring (February – April), existing concerns for the enlargement of this period.
To that effect in this paper they are reported the data concerning the blooming dynamics and the productive capability of four genitors used in the intraspecific hybridization at Amaryllis.

Materials and methods

The biologic material consisted in four genitor varieties: Red (dark red), White (white with garnet striae), Rose (rose with the median nervure white), Salmon (orange), table 1.
The observations have been performed on 15 plants from each variety, from where the bulbs were planted in the soil of the greenhouse. The plants have been prepared for the blooming through the alternation of the vegetative growth with an annual rest period, that begun in July, attenuating the irrigation, and than repose them. The vegetative period started in September when the irrigations restarted.
The observations have been performed from the first flowers opening until the end of the blooming, being marked the total harvest of stems, blooming period and the percent of bloomed flowers by decades.

Morphologic features and aesthetic details of the flower at the used genitor in the morphologic intraspecific hybridization of Amaryllis

Table 1

Variety	Morphologic characterization, color attribute of the plant
RED	The inflorescence carries 2-3 flowers of average size, with an erectly position on the stem. Narrow and acuminate tepals. Intense red color, velutinous, without spots, striae. The median nervure yellow at the basis of the cup. Filaments, red gynodium, mauve color anthers and stigma. Floral stem with average length, green color with a mauve shade, covered by deposit. Long, narrow leaves, in a vertical position on the bulb. Bulbs of average sizes, low proliferation rate.
WHITE	Inflorescence with 2-3 smaller flowers. Narrow tepals, externally reflected. White color with garnet striae, more evident on the upper tepals. The median nervure white, green shaded at the basis of the cup. Filaments, gynodium, stigma white, anthers cream. Floral stem short, slight, of intense green color. Short, narrow leaves, in a small number. Small sized bulbs with a good proliferation rate.
ROSE	Inflorescence with 2-3 big flowers. Wide tepals, rounded, wide, externally reflected. Pink color with very narrow striae of a darker shade. The median nervure wide, white with carmine color striae at the basis. Filaments, gynodium, stigma white, anthers cream. Floral stem long, thick, inelastic. Rich leafage, in a bandy position, of dark green color. Bulbs of big size, a very good proliferation rate.
SALMON	Inflorescence with 2-3 flowers. Narrow and acuminate tepals. Intense orange color. The median nervure green at the basis of the tepals. Filaments, gynodium at the basis, orange towards the top, stigma and anthers mauve. Floral stem of average size, thin. Narrow leaves, straight, manifold. Big bulbs, good rate of proliferation.

Results and discussion

Out of the Table no. 2 it is observed the blooming periods at the four varieties framed between the third decade of April and the first decade of June.

It is remarked through the early characteristic the varieties ROSE and SALMON, that begun the blooming in the third decade of April. Also among these varieties there are differences concerning the rate of bloomed plants in this period, at the SALMON variety being registered higher values (46,79 %) by comparison to ROSE variety (26,6%).

It is also found at the SALMON variety the harvesting peak (46,7%) is in the third decade of April with a lower harvesting rate in the last decade of May (6,7%), and at the ROSE variety the harvesting peak is in the first decade of May.

The other two varieties (RED and WHITE) started the blooming in the first decade of May, among them being differences concerning both the blooming flowers rate, and the blooming period.

So, at the WHITE variety, the rate of the bloomed plants in the first decade of May is higher (26, 6%) than the one of the RED variety (13, 3%), with a harvesting peak in the second decade of May for the both varieties. It is also found the RED variety has a vegetative period longer in this month until the first decade of June, with a blooming rate of 13.3%. Concerning the stems harvest per plant there are close values, all the genitors having an average of one floral stem. The only one variety that shows differences by comparison to the check-test, statistically supported, it is the ROSE variety (significant positive), table 3.

Results concerning the blooming dynamics at the used genitors for the intraspecific hybridization in Amaryllis

Table 2

No.	Variety	Floral stems harvest (pieces/year)	Stems harvest year (%)	Out of which:				
				April	May			June
				3rd*	1st*	2nd*	3rd*	1st*
1.	RED	16	106.6	-	13.3	53.4	26.6	13.3
2.	WHITE	15	100.0	-	26.6	40.0	33.4	-
3.	ROSE	20	133.3	26.6	73.3	20.0	13.4	-
4.	SALMON	15	100.0	46.7	33.3	13.3	6.7	-

** decade*

** registered harvest on 15 plants.*

Amount of floral stems per plant on the used genitors for the intraspecific hybridization in Amaryllis

Table 3

Variety	AMOUNT of Floral Stems per Plant			
	($\bar{x} \pm s\bar{x}$)	±d	t	Signification
V1 (check test)	1.1 ±0.03			
V2 RED	1.0 ±0.03	- 0.1	1	-
V3 WHITE	1.0 ±0.03	-0.1	1	-
V4 ROSE	1.3 ±0.03	0.2	2	*
V5 SALMON	1.0 + 0.03	-0.1	1	-

** DL 5% = 0.22 ; DL 1% = 0.30 ; DL 0.1% = 0.43*

Conclusions

Out of the analysis of the registered data at the four genitor varieties, it results the blooming developed during the period April-June, providing a balanced time grading. It is noted due to the early characteristic the varieties RED and SALMON.

In relation to the other three varieties, at the WHITE variety the blooming period was shorter. The harvesting peaks have been registered middle of May at the varieties RED and WHITE, first decade of May at the ROSE variety, and the third decade of April at the SALMON variety.

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OVERALL STRATEGIES RECOMMENDED OF THE DEVELOPMENT ROMANIAN VITICULTURE-WINE SECTOR IN THE EUROPEAN CRISIS CONDITIONS OF OVERPRODUCTION

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Abstract: *The study examines in depth the environment economic and legislative current wine market, both nationally and globally. All factors that can influence directly or indirectly sectoral policies for the development of trade in wine and the main macro-economic indicators are all in the past review. All economic, social and political mechanisms, which may cause or even impose certain development trends at the national and international are also dismantled.*

Key words: *Romanian wine sector, Romanian viticulture sector, wine market, grafted vines, hybrid direct producers.*

Introduction

Wine market and derivative products is a particularly dynamic market, sometimes unpredictable, in order to indentify correctly the trends and future strategies were used and interpreted data with retrograde.

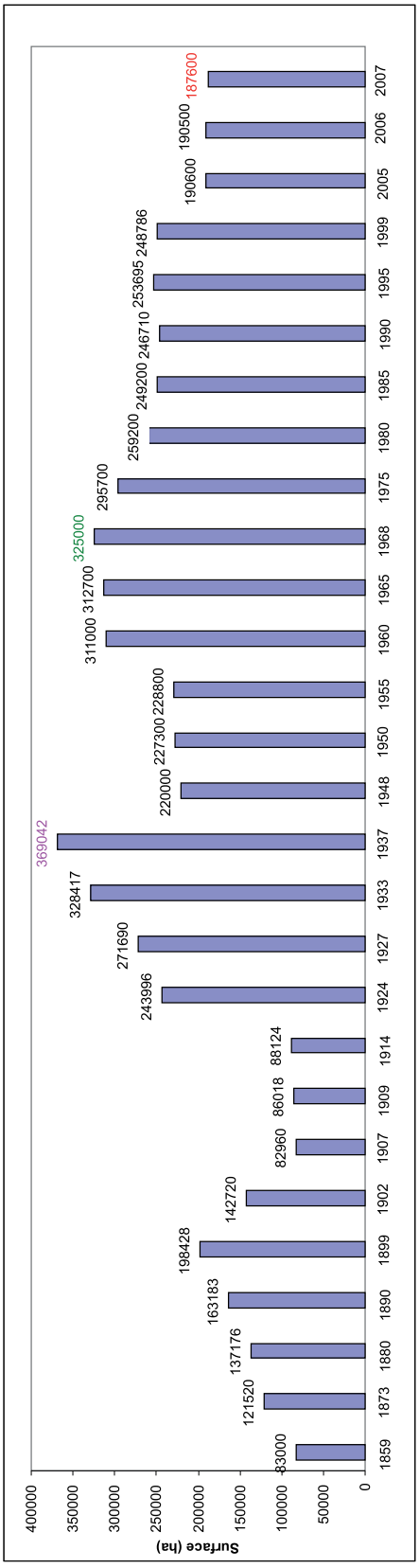
There are analyzed the main chronological transformations that have occurred for each historical stage, and their imprint on the wine. Are listed with both objectivity and discernment positive achievements and the economic and patrimonial failure of Viticulture-wine sector.

The historical stages through the Romanian society and fingerprint left on wine trade by various regimes are also summary reviewed. Although these data are not very eloquent, and analyzed on a global long of time can provide important elements in the identification of trends and future management strategies.

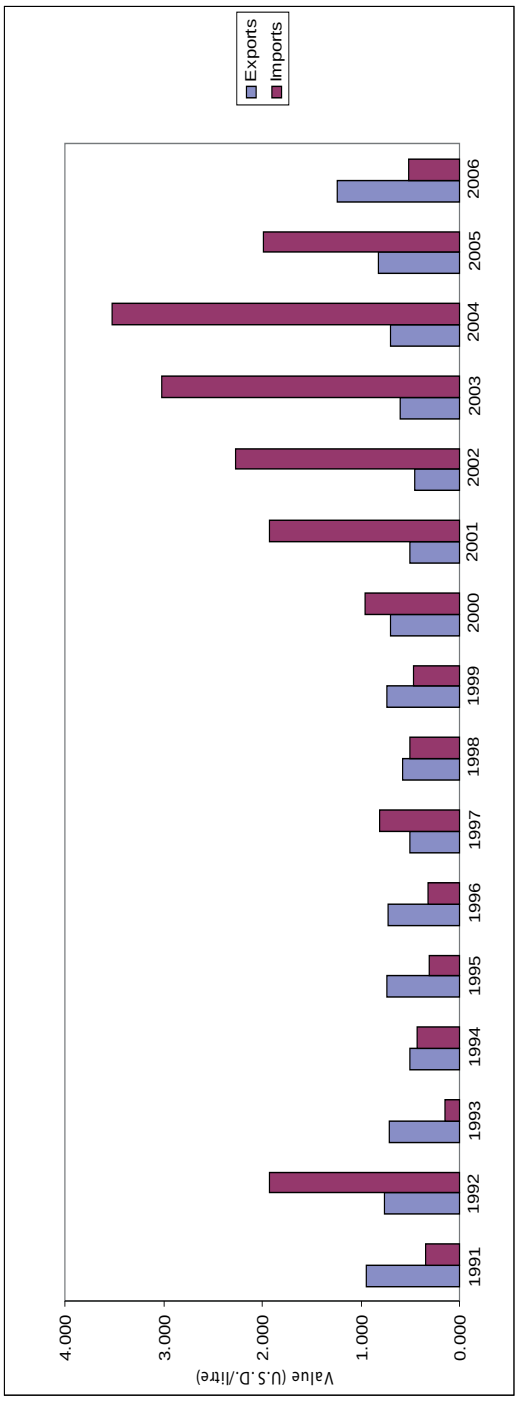
What gives unique work are the main strategies and measures recommended Romanian economic operators active on the world market for Wine in order to increase the sales of Romanian wines, nuanced and scientifically substantiated.

Materials and methods

This paper came out as a need for purpose of a fairly review of the specific condition of the Romanian wine business, in the required condition of the European exclusive market. For a more accurate and relevant use, they have been processed collected and stored up data by the well known professional national establishments as like „Romanian National Archives" (fund archive no. 484) and „Romanian National Institute of Statistics". They are used as sources the data collected by authors from archives (access allowed no. 580/2004), and also data shown in the papers „The farms and livestock, the period 1837-1939", „Romanian Statistical Yearbook 2008" and „Romanian agriculture (1938-1990)".

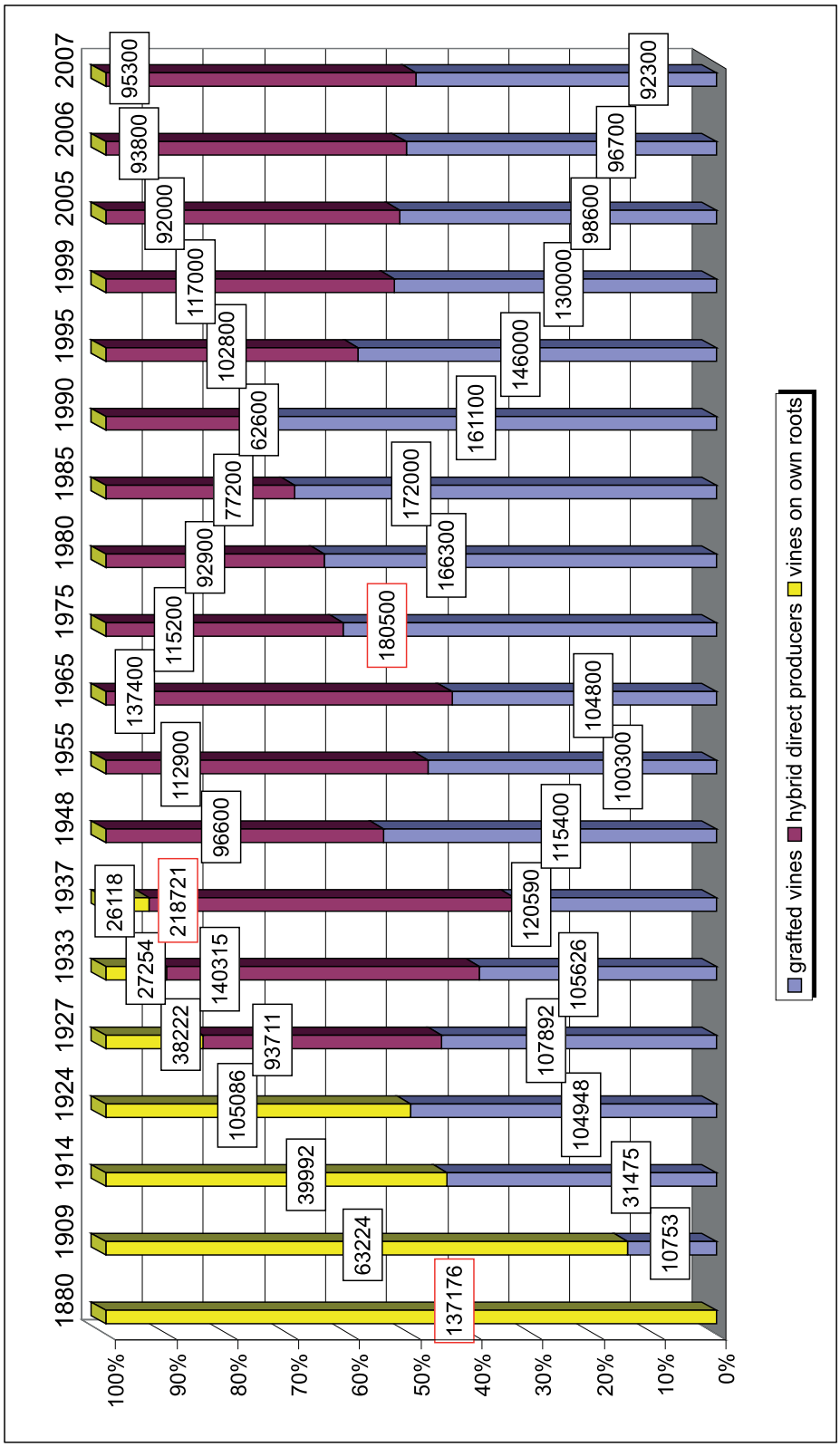


The evolution of the vineyard in Romania (1859 – 2007) - surface (hectars)

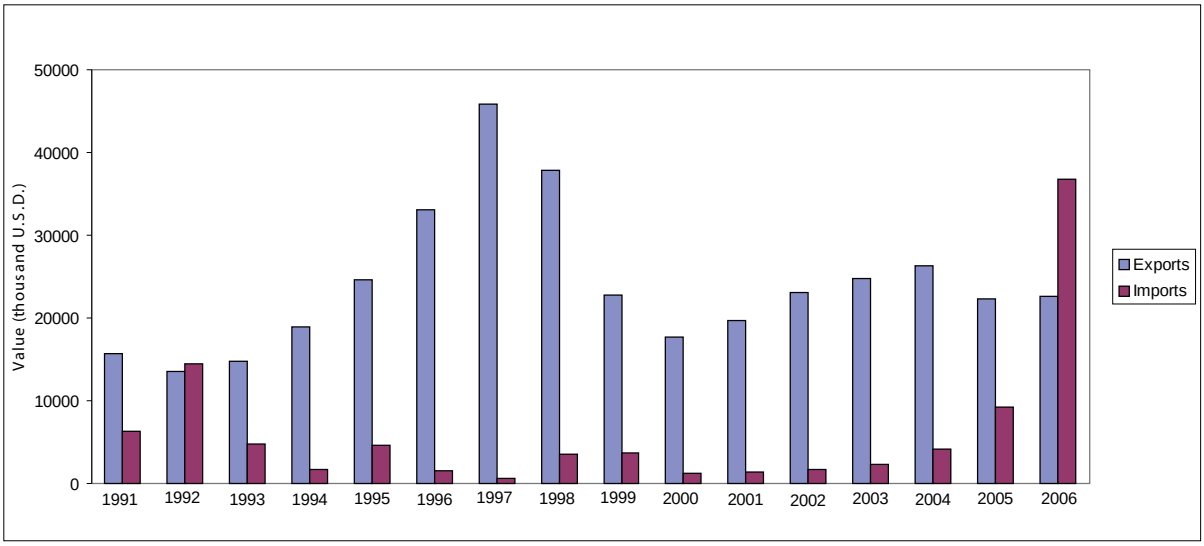


The imports and exports evolution of wine in Romania in value - Value (U.S.D. / litre)

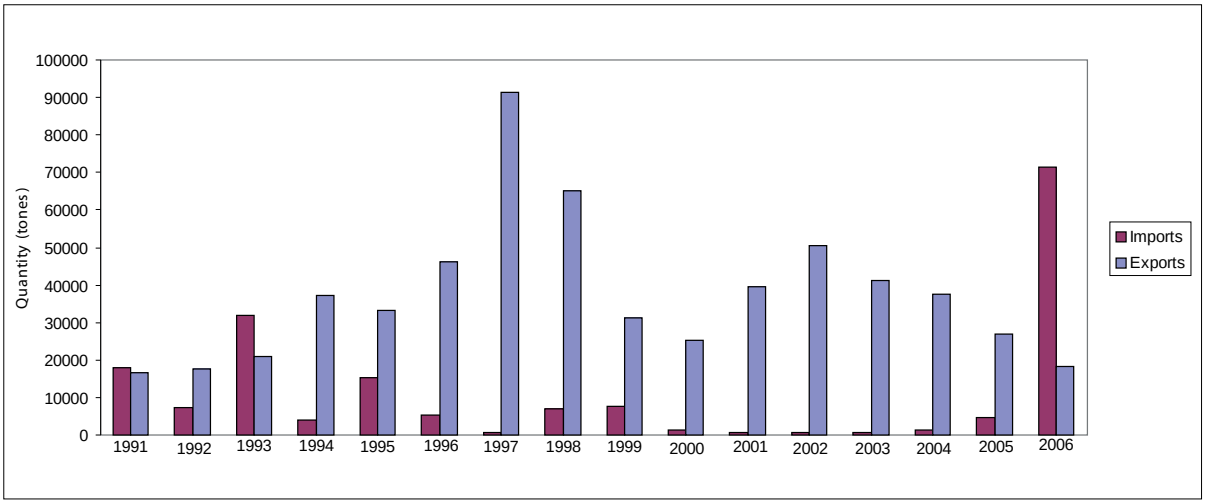
The surface evolution under plantations grafts and H.D.P. in Romania (1880-2007)



The imports and exports evolution of wine in Romania in value - Value (thousand U.S.D.)



The imports and exports evolution of wine in Romania in quantitative - Quantity (tones)



Results and discussion

» Weak points:

1. The large share of hybrid direct producers (H.D.P.)

Areas occupied by direct producer hybrids and the production of grapes from these presents a big problem for Romanian wine trade because under Romanian and European legislation wines hybrids, even in mixed wines from Vitis vinifera, are prohibited from trading. In this context, the short and medium term, Romania is the impossibility of increasing production capacity winery, even under conditions of market demand, because the biological and economic ballast for the wines of hybrids.

2. Unfavorable international conjuncture

It is clear that in recent years tended to occur European restrict wine production areas, and even reduced, with all collateral economic consequences resulting from it: unemployment, retraining, economic recession for small local communities, etc. In other words, at this time throughout the European wine community is expensive and sell low. Also, under pressure from existing stocks, finding new outlets, for the producer equals with wine eastern European invasion that anyway it not faces the quality standards.

» Strengths:

1. Pedo-climatic potential

Located one side of the parallel of 45 degrees, Romania offers an extremely favorable climate cultivation of vines around its entire territory.

THE RULES (EC). 479/2008 which was published in the „Official Journal of the European Union" 06.06.2008 delimiting areas of European vines, depending on favorable pedo-climatic into six classes:

A class, B class, CI class, CII class, CIII a class and CIII b class.

The legislation applicable in all Member States and binding in its entirety recognizes favorable pedo-climatic Romanian vineyards including them in classes B, CI and CII.

2. Small producers, the development sector winemaking Romanian

Analysis of trends in the European and international, independent wine producers are known all over the world, significant pressures from multinational competitors. Over time, the wine will lose its becoming more "local citizenship" to be integrated into global production networks, controlled by transnational companies, with a redoubtable financial strength.

To counteract this, small local producers are able to modernize winemaking holdings by accessing European funds for rural development and free association in regional cooperatives.

Conclusions

» ***Romania, importing country***

According to official statistics in recent years, acknowledged officials and the employers, Romania has the status of the wine importing country. For example, only in the first half of 2007 the quantity of wine imported was nearly three times greater than that exported. Thus, Romania became approximately 21,000,000 liters of wine of which approximately 10,000,000 liters of Spain only, while total exports to Romania amounted to 8,620,000 liters of wine; this trend is maintaining and the future.

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COMPARATIVE EXPERIMENTAL STUDY ON THE CHEMICAL DEACIDIFICATION OF OVERSULPHURED MUSTS (OSM)

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Abstract: *We have obtained MCR substitutes starting from OSM, through an innovating and efficient technological process, which ensures the deacidification with CaCO3 through the precipitation of calcium tartromalate. This process implies the determination of the CaCO3 dose necessary for the deacidification through laboratory micro-trials. It is achieved by only following the pH variation, because musts are complex environments in which the anions of organic acids are more or less buffered. The procedure carried out is more efficient than the well-established process Dicalcic, because it ensures the most rapid precipitation of double salt, linked to the volume of the deacidified must.*

Key words: *OSM, wine deacidification, chemical deacidification, deacidification with* $CaCO_3$

Introduction

We have carried out a comparative experimental study with a new process for chemical deacidification of OSM with CaCO3 and the already known process "Dicalcic", in order to establish the most efficacious alternative.

The new procedure (1, 4) stresses the control of the tartric /malic acid ratio (at least equal to 150 / 134), the determination of the optimum dose of CaCO3 only through the control of the pH evolution, the first deacidification stage (10% of the OSM used for the formation of sludge whose pH reached 5.5), the second deacidification stage (which ensures the formation of the double salt at a pH level above 4.5). For this procedure, we have considered the example presented in table 1.

The Dicalcic procedure (2, 3) does not need any equivalent contents of tartric and malic acids because the tartric acid meant for the double salt formulation is replaced by an intake of neutral calcium tartrate (CaT).
The product called Dicalcic is a combination which contains CaCO3 and CaT powder, as well as small quantities of double salt of calcium tartromalate in order to allow for the crystallization of double salt under a preferential crystalline form.

Through the Dicalcic process, the acidity of OSM can be reduced through the elimination of the malic acid, regardless of the contents of tartric acid in the products to be deacidified; at 4.5 pH, the malic acid can displace the tartric acid from its neutral calcium salt, leading to the formation of calcium tartromalate.

The evolution of the main physical-chemical parameters involved in the deacidification process of OSM in $CaCO_3$ (1)

Table 1

Analysed parameters	Phases in the achievement of analytical control			
	OSM In the initial phase	**OSM After corrections**	**OSM Deacidified fraction**	**OSM finally**
Sugar, g/l	145	145	143	144
Acidity, g/l tartric acid	7,33	8,00	1,51	4,67
Tartric acid, g/l	3,61	4,27	1,04	2,55
Malic acid, g/l	2,95	2,95	0,12	1,47
pH	2,92	2,83	4,72	3,55
Free SO_2, mg/l	380	470	445	458
Total SO_2, mg/l	715	820	838	827
Calcium, mg/l	107	102	335	182

Materials and methods

The comparative study of these two alternatives is based on the evolution of pH during the acidity reduction with CaCO3 depending on the time until the optimum stage of 4.7-4.8, which corresponds to the formation of double salt of calcium tartromalate.

At industrial level, beside the regular control of pH which ensures permanent superior levels at the critical threshold of 4.5, it is recommended to use the nephelometric control of calcium contents of the deacidified fraction, which allows the follow-up of the insoluble calcium tartromalate formation.

It was found that when the calcium contents are around 100 mg/l, the mechanical stirring has to be interrupted because at that stage the calcium tartromalate crystals are rapidly sedimented and the deacidified fraction can be filtered and immediately mixed with the non-deacidified fraction (2, 4).

The results (4) confirm that finding. In the case of "Dicalcic" procedure (2, 3), higher calcium contents (ranging from 300 to 400 mg/l) were highlighted in the deacidified fraction before it was mixed with the non-deacidified fraction. When the calcium content in the deacidified product decreases well under the optimum limit of 100 mg/l, it is necessary to maintain in suspension the calcium double salt already formed. The inhibition of such critical situations is possible through the use of an optimum proportion of crystallization seeds.

In the laboratory, the comparative study of chemical deacidification processes (figure 1) followed the evolution of the pH decrease during must treatment in the sludge formation stage (pH≈5.5) and until the adequate stage for the formation and precipitation of calcium double salt (pH≈4.7). The must with an acidity of 9.2 g/l tartaric must was administrated to identical quantities of 1 g Dicalcic product 30 and 1 g CaCO3 weighed on an analytical scales Mettler AT 200.

The administration of must with a graded burette on the deacidification agents was carried out at constant volumes "V" of 10 ml each; the homogenization after must administration was carried out during a constant T period of 5 minutes for each

must administration, being performed mechanically with a Variomag stirring device. The control of pH variation was performed in all cases after the end of the mechanical homogenizations, with a Mettler Delta 320 pH-meter.

Results and discussion

The volumes of administered must symbolized by the x-coordinate of the diagram in figure 1 show its increase each time with a constant 10 ml "V" unit.

It was observed that in the Dicalcic alternative, the optimum pH of 4.7 is reached after the administration of a must volume equivalent to 6V (60 ml), whereas in the newly developed procedure the same pH level is reached after the administration of a must volume equivalent to 12V (120 ml).

Taking into account the time factor, it appears that the Dicalcic procedure is more efficient. If we consider the must volume necessary for the performance of deacidification, we notice that the newly developed procedure is more efficient because 1 g CaCO3 ensures the deacidification of 120 ml must, whereas 1 g Dicalcic 30 allows for the deacidification of 60 ml must.

It is also observed that the precipitation of calcium tartromalate formed is more difficultly performed if Dicalcic 30 is used, than if CaCO3 is used, so that the time factor operated unfavorably for the Dicalcic procedure. The same findings are obtained in the industrial trial performed on loads of 2500 liters of must.

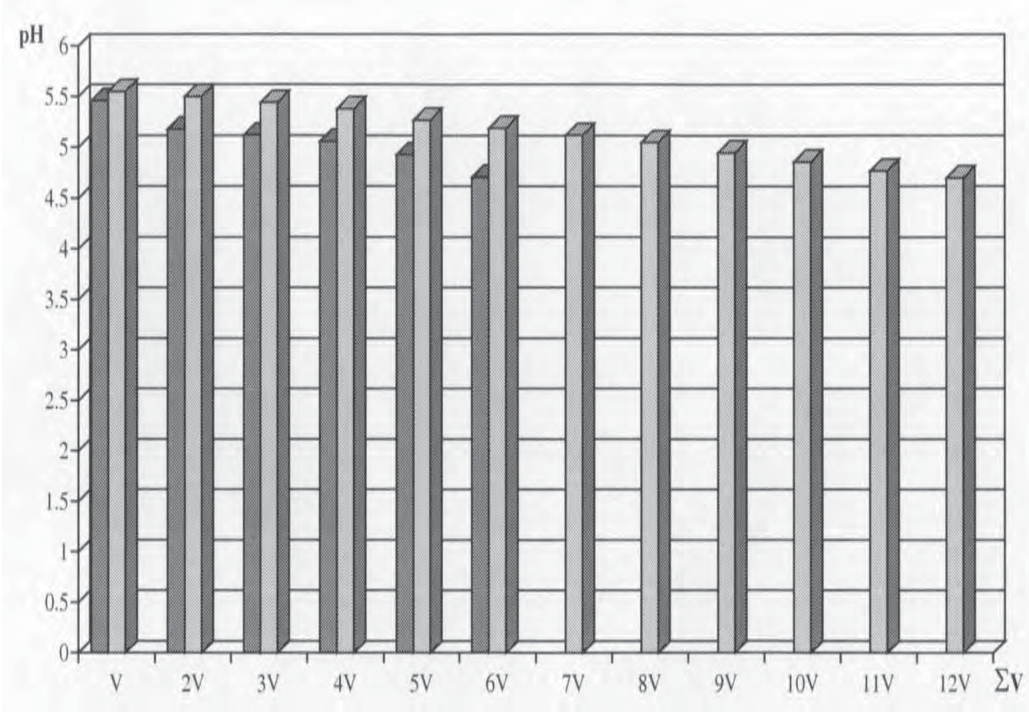

Figure 1 – Comparative evolution of pH reduction of OSM during its administration in constant volumes V of 1g of Dicalcic 30 product (▬) and of 1g CaCO3 (▬)

Conclusions

The critical analysis of the two deacidification procedures allows us to make the following assertions:

» The Dicalcic process is less efficient because it is characterized by slower formation kinetics – double salt precipitation, following the direct dependence of its precipitation velocity on the CaT solubilization velocity of the Dicalcic product.

» The longer duration of the Dicalcic product implies an unjustified reduction of the production and storing capacities.

» The financial effort necessary at industrial level is lower for the Dicalcic product because the costs for the deacidification product are lower than those of the newly developed procedure which also involves (beside the necessary cost of the CaCO3 used) the cost of the tartaric acid for the initial correction (applicable only for a higher concentration of malic acid in OSM).

» The complexity level of the two procedures is similar because they both require regular pH control, high-standard systems of homogenization, precaution in the administration of products to be deacidified after sludge formation.

» The energetic consumption is higher in the Dicalcic procedure.

» Both procedures comply with the international regulations, except for the specialists' doubt for deacidifier product such as Dicalcic, which trigger the unjustified excess of calcium, a potential source of new tartaric precipitations.

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