



Summaries of the Papers Presented within Students' Symposium Organized by the University of Agricultural Sciences and Veterinary Medicine Cluj - Napoca, May 2009

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Production of beer and the impact on the environment. Case study S.C. URSUS S.A. Cluj-Napoca - Albus A. After the adesion of Romania to the European Union, the industrial domain had to align the tehnology to the standars dictaded by the EU., wish to reduce the impact on the environment. In such situation is also S.C. URSUS S.A. CLUJ-NAPOCA. SC. URSUS S.A. CLUJ-NAPOCA specialized in the production of beer, with a tradition of over 125 years belong to the potential source with impact on the environmental from Cluj-Napoca. This paper have as an objective, the reduction of the emissions and the pollution, the minimize and reduction of the waste, the rational usage of the energy and the reduction of noise and vibration. The attein of the objectives it is possible throught a heedful monitoring and usage of a modern tehnology with equipments for retention, exhaus and dispersal of the pollutions in the environment. Because of modern tehnology hold by S.C. URSUS S.A. CLUJ-NAPOCA had been observed that it has no significant impact on the environment.

The study, the monitoring and the management of waste within Gorj county - Argintaru A. The bad managing of waste is one of the environmental problems facing Gorj county can seriously harm the environmental factors and people health. Annually large quantities of waste are generated because of obsolete facilities and technology in the local industry. Once generated, the waste could be reused, treated, recycled or transferred to a treatment station for hazardous waste or to an incinerator to reduce its volume. Recovered waste (domestic, municipal and assimilated, biodegradable, etc.) are usually stored. Each stage of their management can present a

potential risk to the environment. Mining, energy industry, agriculture and household activities are sources of waste generation as it concerns the quantity and the environmental impact. The knowledge of the waste production, their management and their monitoring are important for the knowledge of potential risks to the environment and human health and also as it concerns the solutions for reducing or eliminating them.

Ecological reconstruction of coal mine exploatation – mining perimeter Bodoş, Bovasna county - Balazsi A. The Perimeter established for the mining quarry Bodoş is located in the south-western part of Covasna county, in the Căpeni – Baraolt coal basin. The Main activity of the Bodoş Open Pit is: extraction of lignite by open pit methods. It is extended on a surface of 107 Ha. The activity was ceased in 2004. The ecological reconstruction was started in 2007and will be finished in 2009. My thesis refers to mine closure and the actions that were proposed and executed for the environmental remediation and reconstruction, which could be sorted and succeeded in this way: general cleaning of the site; excavation and transport of 3 million m³ of material from waste tips, curtilages, benches and slopes; reshaping of all mine waste dumps at a slope angles below 1/3; construction of erosion fences and gabion walling to ensure long term stability and erosion control; seeding, planting with local species of trees or shrubs of the affected area; protection of rehabilitated surfaces and water river flows, by guard ditches and drainage systems in total length of 2800 m. The purpose of ecological remediation was to re-introduce this area in the agricultural cycle. After finishing this reconstruction this purpose will be achieved

Sources of pollution and major environmental problems at SC Kronospan Sebes SA - Bordeanu

B. M. The following paper is about the major environmental problems at SC KRONOSPAN SEBES SA, from Alba district, which has as object of activities the production of wood fiber boards of medium density of MDF type, production of urea-formaldehyde resins required for the impregnation of MDF boards, as well as the chemical substance, formaldehyde. This paper contains a brief image about the ways in which an enterprise from the industrial area can have a more or less significant impact on the environment and is structured in several chapters: some general information about the location of the enterprise and its proximity; the main technological processes that are being performed in the enterprise as well as the raw materials with significant impact over the environment; sources of pollution and their impact in the quality of air, water and soil; the administration of dangerous waste materials that result in the technological processes. In the end I would like to conclude by presenting once again the major environmental problems and the ways in which we can diminish them.

Environmental evaluation for plans and programs, realised in the sites of community importance from Natura 2000. Case study:

„Environmental report for zonal city planning - Valea Plesca – Faget izvor municipiului Cluj-Napoca”- Casoni S. Environmental evaluation represent to elaborate the environmental report, consulting the public and the officials interested of the plans effects, to consider them and informing the decision. The environmental report for Valea Plesca – Faget Izvor Municipiului Cluj-Napoca is realised for obtaining the environmental notice, necessary for the Zonal City Planning. This report contains: plans objective, present state of the environment, environment characteristics of the possible affected zone, the actual environmental problems, environmental protection objectives of the plan, the measures proposed for preventing the plans effects above the environment, exhibit the reasons which led to the made choices as well as the description of the measures for monitoring the effects of the plan.

Contributions to the knowledge of pedogenetic coating and biodiversity in National Park Rodnei Mountains - Cifor N. National Park Rodnei Mountains is the vastest protected area of the North Eastern Carpathians, with a surface of 46399 hectares. Geologically speaking the majority of the Rodnei Mountains is constituted of crystalline shale,

quartzite and mica shale, from which are formed the majority of high peak the granites are upon Negoiasa, and the volcanic rocks as andesites and dacites are located at the periphery of the park. On the pedological, luvisols are frequent meet upon hilly and under mountain floor of the west and south-west side of the massive, or under *Agrostis capillaris* mezofile grasslands, or under durmast bunches. Districambosols and black soils are meeting under the beech and beech-resinous forests. In spruces floor, the majority of surfaces are occupied of prepodsoils rich in organic matter, and under the superior limit of the sub alpine floor and in the inferior alpine floor are meet humisols. Biodiversity meet in Rodnei Mountains National Park contains a lot of species, of which some endemics (*Silene nivalis*), and special fauna items: chamois (*Rupicapra rupicapra*), grouse (*Tetrao urogallus*), coconut of birch (*Tetrao tetrix*), marmot (*Marmota marmota*), Carpathian deer (*Cervus elaphus*), roe deer (*Capreolus capreolus*) etc.

The determination of biogas yield potential of different energyplants - Ciure A., S.Zielonka.

The energy crops are gaining more importance in the area of renewable energy, being considered a considerable source of biomass. The purpose of the approach was to determinate the energy potential of some energy crops. As material was studied maize, grassilage. There were calculated the energetic value of the tested crops, due to the determined raw composition. The biogas and methane production potential were determined with the laboratory test method by anaerobic digestion in batch system after the HBT (Hohenheimer Biogasertragtest) test. The results obtained by the two methods are relevant for the prognosis of the suitability of the energy crops as biomass for biogas production.

Water quality assesment of Someșul mare stream (jud. Bistrița Năsăud) based on different biological and chemical indicators - David M., I. D. David, L. Grapini, G. Donca, I. Găzdac.

This study concern the water quality assessment of the Someșul Mare stream using biological and chemical indicators. The objective was to establish the impact of decantation pond from Valea Mare village, on the structure of the benthic invertebrates community and some chemical water parameters. Analysing the both sample points, downstream and upstream of the source pollution, no significant changes was observed in biotic community while some differences was observed in water chemical proprieties. Measured chemical parameters reveal high pH value upstream compared with downstream

point, no nitrates present at both points while phosphate was found at high level. The structure of benthic community is dominated by the species indicating a clean water, like Plecoptera and Ephemeroptera.

Study regarding the optimization of domestic waste collection activities in Brasov - Fleşeriu A., A. Albuş. This paper presents certain methods as an attempt to optimize the activities of domestic waste collection and transportation, waste that began to gather in increasing amounts with population growth and rising living standards. The objectives of this project are: implementation and improvement of the domestic waste collection and transportation system, selective domestic waste collection and transportation and reducing the environmental impact, collection and recovery of economically unattractive waste but with major impact on the environment: P.E.T., plastics. The objectives described above will be supported by: establishment of the domestic waste collection and transportation operators, improving awareness and education of the population on selective domestic waste collection, granting of bounties and training subsidies, purchase and equipping of localities with selective collection containers, improving specialized transportation vehicles.

The mining industry impact evaluation in the Jiu valley environment - Gâlcă A. The environment quality evaluation in an area at a time is possible by assessing quality of air, water, soil, flora, fauna and population's health in that area. These factors can be characterized by the representative quality indicators for assessing the degree of pollution and for which there are permissible limits set. A simple method of evaluation the environmental pollution degree on a site represents an *overall index of pollution*. The environment activities in site integration are evaluated by synthetic assessment based on these quality indicators. According to normal limits are given the quality notes. The quality notes obtained for the five factors are used to design a chart as a method of simulating the effect of synergistic product pollutants. The method was applied to the basin of the Jiu Valley. Index calculation of global pollution, taking into account the factors mentioned above (the others having insignificant influence), a result that environmental impact is within acceptable limits in the Jiu Valley.

Monitoring ways for nitrate content in potable water from rural areas – a case study, Apahida village - Holban N. A case study performed in Apahida village aimed the monitoring of nitrates content in potable water from rural areas. Their concentration was monitored from three collection points. The study was performed during September 2008 – May 2009, and results are the average of the monthly laboratory determinations. Two monitoring ways of the nitrates from potable water were compared, one using the UV molecular absorption spectrophotometry – standardized laboratory method, which needs the sample prelevation, transport and preservation at 2°C, and also direct quantification at sample harvesting place using the spectrophotometer portable device. In both cases, the results exhibit the same evolution. In two locations they emphasize values under the maximum admitted concentration and one over the limit, compared to the stipulations of the Law 458/2002 (50 ppm), but with considerable differences between methods. As consequence, the main conclusion is that for accurate quantification, the adopting of the more difficult standardized method is imposed.

Environmental evaluation for activities that take place Natura 2000 sites „Nase study of the Vladeasa zonal territory development plan” - Marcu S. When Romania joined the European Union, our country got involved in the creation of the Ecological network called Natura 2000. The project includes 275 sites of European interest and 108 areas of Avifaunistic special protection. The Vladeasa Mountain is included in the biggest Avifaunistic special protection area in the sixth North-Western region (it has an area of 96.223 ha and it expands over the territorial boundaries of 3 regions: Bihor-Cluj-Alba), attracting the need for the creation of a development plan for the region which comes in the aid of conservation of the environment and social development. The regional territory development plan – Vladeasa, comes in the aid of the local community through the creation of the telecommunication, water and power networks. It also creates a very important waste management plan. After evaluating the impact of the activities that make this plan, we have reached the conclusion that its implementation will affect in a positive way, the ecological, social, economical, and cultural factor, yielding an increase of the touristic potential along with the increase of the quality of life and environment.

Practical approach of the analytical chemist in environmental monitoring techniques -

Moldovan B., C. Balint. Relevant data concerning the possibilities of environmental quality monitoring are presented. They aimed to the practical approach of domestic residual water monitoring, concerning the nitrites, nitrates, ammonia, sulfates calcium and magnesium content. Standardized techniques were used, specific for the instrumental analysis (UV – VIS molecular absorption spectrophotometry), but also classical analytical chemistry techniques, as gravimetry and volumetry. Instrumental analytical chemistry techniques were also used in determination of the physical indices of water quality, meaning conductometry and turbidimetry. The study was performed within the University of the Agricultural Sciences and Veterinary Medicine Cluj – Napoca, and monitored water named Pârâul Popii was twice a month observed, during March 2009 –May 2009. Even the aesthetical landscape of the water was frequently injured due to the abundance of the domestic wastes and pet waste, none of the analyzed parameters were over the admitted limits stipulated by the Governmental Decision 188/2002 concerning the quality indicators of waste waters. The pH was also within the normal limits, between 6.5 and 8.5 pH units.

Noise pollution in Cluj-Napoca - Moldovan M. In the recent years noise has become the main cause of discomfort of the population. In Cluj-Napoca the sound exposure is kept at high levels, mainly due to road, rail and air traffic and public works, which are considered the main sources of noise pollution in the environment. In Cluj-Napoca there are set up 8 points of measurement, which are representative for auto traffic. The noise level was measured by short measurements of 30 min according to STAS 10009/1988 and 10144/1-90. Permissible limit for traffic is 65 dB. During a day there were established two high traffic periods in which there were measured more individual and simultaneous samplings. The equivalent noise level was determined with the Brüel & Kjaer type 2250 portable sonometre. The most important sources of noise are the auto traffic, estimated at approximately 80% of the overall noise pollution. The maximal noise levels are due to heavy traffic in particular, the technical condition of vehicles and the quality of the roads. To reduce the noise levels, generated by various sources in urban areas of Cluj-Napoca, the following measures can apply: ensuring smooth traffic on the main roads, creating the belt lines, blocking noise propagation by creating natural protection curtains near inhabited areas and

implementing of technical measures at the main noise sources.

Research concerning of the technology ecology cultivation the species of *Satureja hortensis* L. -

Nagy I. From the ginger is used the part in the air of the plant (*Satureja herba*). The herb contains volatile oil (0.5 – 2.7 %), is used for the stomach disturbance, anorexia, diarrhea, and like condiment. Based on defined biometry made in experience ecology with the *Satureja hortensis* L., in year 2008, determined as weight media the plant grows up the first stage of ingathering till the fourth stage of ingathering (from 27.5 g to 130.7 g). The period of vegetation in the year 2008 is 103 days (18.05 – 28.08). The most high production of the herba takes note in the third stage of ingathering (10447 kg/ha), over the witness (2663 kg/ha). The contents of triterpenic acid (g %) raised the most in the second stage of ingathering (3.3287 g%), stage that indicates the optimum moment for ingathering.

Management of biodiversity and measures to reduce the degree of water and soil pollution in "Rodnei mountains" national park -

Negrusier C. The Rodnei Mountains National Park is situated in the north side of the Eastern Carpath, covering the majority of Rodnei Mountains area. The ecosystems degradation and destruction is the consequence of human activities. The contamination of the underground and ground waters, the deterioration of the soil properties, the surface efflux, the excessive grubbing, the landslides, inert material deposits, the landscape degradation are only a few results of the anthropical impact viewing in the Rodnei Mountains National Park. The measures to reduce the degree of water and soil pollution are: the adoption of the quality system of environment surveillance, the application of soil and water preservation measures in wearable area, the establishing of forest protection screens, measures of regularization and water purification, maintaining the natural vegetation over the low productivity soils, the interdiction of using chemical fertilizing and pesticides.

Communitarian policies in atmosphere protection -

Nicula G. Within EU, the atmosphere protection policies are governed by the frame directive concerning the air quality. This was adopted in 1996 by the Environmental Council and aims: definition and nomination of the objectives for air quality in UE; estimation of the air quality in member states; obtaining appropriate information concerning air quality and assurance that these information will be available for public, using alert thresholds; maintaining the air quality where it is

satisfactory and improving its quality where necessary. The imposed regulations were completed in time by three daughter directives, which establish the limit and target values for each identified pollutant. The first daughter directive (1990/30/EC) establishes the limit values for NO_x, SO₂, Pb and PM₁₀. The second, establishes the limit concentrations for C₆H₆ and CO from air, and the third, values named by WHO and intermarry target values of ozone in air until 2010. Our days, in Romania, the monitoring of the atmosphere quality for establishing the degree of accomplishing the requirements of the present European directives assimilated by the national legislation is performed by 117 continuous air monitoring stations, equipped with automate devices for measuring the concentration of the main atmospheric pollutants.

Study regarding possibilities on using the biogas for co-generation units in Romania - Opincariu A. Biogas represents different gasses mixed together, main components being represented by methane and carbon dioxide, in variable proportions, but there is, in smaller quantities sulfur hydrogen, nitrate, carbon oxide and ammoniac. Biogas can be used for simultaneous production of electric and caloric energy using specific energy co-generation installations. Regarding the high efficiency of energy production through this method, lately, co-generation systems have spread very much mainly seen in zoo-technique farms as organic mater processing units. For promoting the production of electric energy from renewable sources of energy, in Romania is applied the system of obligatory cotes combined with green certificates trade. Green certificates annually obligatory cotes, for energy from biogas, are as followed: 6.28% for 2009 reaching 16.8% in 2020. Co-generation units present different advantages, mainly reduction of primary fuel consumption and reduction of gas emissions in the atmosphere.

The use of *Eisenia fetida* to asses ecotoxicological effect of torque 550 sc pesticide - Opriş R., C. Moroşan, A. Neag. Ecotoxicological research is considered for testing the toxicity effect of different chemicals applied in agriculture. The most used soil organisms test are: *Eisenia fetida*, *Lumbricus terrestris*, *Folsomia candida*. The objective of our study was to asses the toxicological effect of Torque 550 SC pesticide on earthworm *Eisenia fetida*. The test was made according with International Standard ISO 11268. The results showed that the use of Torque 550 conducted to a high mortality on test organism. At a concentration level of 1000 mg/kg the registered mortality of

adults was 100%, at 100 mg/kg the mortality was 70%, at 10 mg/kg the registered mortality was 90% while control showed a adult mortality of 30%.

Determinations of pollution effects on Romania's beech forests - Papp R. On a global level major alterations concerning forest heath can be seen due to the climate changes and atmospheric pollution. The forest represents a major pawn in the battle against global warming that's why health monitoring and taking preserving measures are vital to it. Beech forests have a major role in preserving an ecological balance; they have a great capacity to regenerate, important anti-erosion and climatic role regarding this monitoring and conserving this specific forest are compulsory. In Romania beech forests represent 31% from the total forests, the beech tree being one of the most popular and resistant deciduous trees. The Carpathic beech forests are affected by atmospheric pollutants like: tropospheric ozone, carbon dioxide, sulfurous oxides and nitrogen oxides. Identifying and studying these pollutants can be made by analyzing air quality. To this studies can be added the tests made on bioacumulative and bioindicative trees. Data interpretation of these tests lead to finding the date of appearance and evolution state of the pollutant effect and it's nature. All these allow taking measures for diminishing pollution effects and its negative impact.

Case study regarding ecological rehabilitation of Romanian Negoiu mining perimeter, of Calimani mountains - Păşcuţ M. Romanian Negoiu mining exploitation is located in Calimani massive. The mining activity objectives were: sulfur rocks extraction of the quarry, obtaining of sulfur concentrate with 99.5% S and its shipping to the beneficiary. The mining exploitation was closed in 1997, but the greening work started hardly in June 2008. The greening work that follows to be carry on contains: work executed in quarry, sterile holds greening, others liberated fields' rehabilitation, decantation pond rehabilitation, construction of an ecologic dump for nonconforming materials and constriction of a waste water treatment station. The greening work specify mainly the correction of acid reaction of the soil, through application of amendments based on calcium, holds embankments consolidation, constriction of water table, water retention barrages rehabilitation, construction of coast wooden fence with the aim of minimization of soil erosion, bringing vegetal soil in ecologies areas and its fertilization, insemination or sapling planting in rehabilitated areas.

Collection, recycling and waste from reuse paper and cardboard from SC Mucart S.A. Cluj-Napoca - Perțe O. Compared to virgin fiber, secondary inkless fiber used in the manufacture of paper presents a number of advantages for environmental protection, namely: the conservation of forest resources, reducing the release of odoriferous gases into the atmosphere, in some cases, reduce the flow and load consuming substances tributaries of oxygen. The paper and paperboard factory S.C. Mucart S.A. Cluj-Napoca uses technology to re-use organic waste paper and cardboard collected from households and businesses.

Industry impact on the environment European standards for intensive swine farms case study: SC Vereș Agro Prod Com SRL - Platon A. Agricultural activities involving intensive pig farming can lead to a number of environmental problems: acidification (NH₃, SO₂, NO_x), eutrophication (N, P), the reduction of the ozone layer (CH₃Br), increasing the greenhouse effect (CO₂, CH₄, N₂O), groundwater pollution, local inconveniences (smell, noise), the spread of heavy metals and pesticides. A good example is the farm Veres SC AGRO PROD COM SRL PIȘCOLT, Satu Mare, whose main activity is intensive pig farming, the case study includes information about the location and neighborhood, facilities and technology flows on the site, sources of pollution and their impact in the quality of air, water and soil, waste management. This paper presents an overview of the ways in which an intensive pig growth farm can cause environmental impact, being given the fact that, in that farm a comparison is being made between the technology and emissions, with the European references about the best available techniques - BREF / BAT.

Study on integrated waste management in Bistrita-Nasaud county - Roșu-Mareș C. The issue of waste management is one of the biggest challenges for the XXI century. Given the increasing annual quantities of waste and worry that it produces the world community, is a growing emphasis on waste issues related to quality of life. Data on municipal waste generation and equivalent in Bistrita Nasaud county is provided by the health operators in the county and is based largely on the estimates and not on precise data, results of weighings. Sanitation services to towns are conducted under the supervision, management or coordination of local authorities. Organization of the management of production waste generator is required. Economic units performed these tasks with their own means or contracting the services of specialized companies.

Assesment of the Abrudel river (county of Alba) water quality based on different chemical and biological indicators - Șandor V., A. Opincariu, I. Matora, A. Rotariu, R. Rășcanu. The objective of the present study consisted in water quality evaluation of the Abrudel River, located in the miner region of Apuseni Mountains, based on different chemical and biological indicators. The structure of biotic community in lotic ecosystems reflects water quality. Changes of benthic community structure are essentially due to the water chemical parameters variation. For our study we have chosen two sample points upstream and downstream towards two pollution sources: Rosia Montana stream and sterile dump from the Cărpiniș village. The obtained results pointed out that chemical parameters, as well as, benthic community structure have significant changes downstream of pollution sources compared with upstream sample point.

Assesment of the Valea Mare stream (Alba county) Water quality using different chemical and biological indicators - Secară B., C. Todea, L. Sabou, A. Tămaș. The objective of the present study was to asses the water quality of the stream Valea Mare, located in the Apuseni Mountains, on the basis of certain chemical and biological indicators. The community structure of the benthic invertebrates reflects the quality of the stream water, whereas possible changes of this structure are caused, mainly, by the changes in water chemistry. In order to achieve these objectives two sample collection points were chosen, upstream and downstream of the rural dwellings in the Bistra village. The results of the chemical and biological analyses underline the fact that between the two sample collection points there are no major differences in benthic community and chemical water proprieties. As a conclusion, we shall state that the anthropic activities in the region do not conducted to significant changes in water quality of the Valea Mare stream.

The evolution of water condition from Black Sea's offshore - Stremțan A. The first part of the paper presents a short description of the Black Sea's offshore according to the position area, and also as litological, climatic and hydrological point of view. Next part presents the main indicators of water's quality, such as: organic substances, nutrients and dangerous substances. It is also described the process of „water's blooming” and offshore's

erosion. The strong link between Black Sea and Danube is marked out by the river's effects on the Romanian sea's waters. The human activities involved in that area, induces a certain kind of impact on the natural habitats and, also, on the population. Each indicator that was analyzed, shares the condition of water's quality at a certain point. The studies were realised during a several years. In the wake of analyzes and obtained results, it's being elaborated a series of measures about bettering and aproving Black Sea and Danube river. Thus, Black Sea can be administrated only by a strong cooperation between all countries from Black Sea's offshore, under the auspices of the Commission for Black Sea's Protection against Water Pollution.

Management of collection, transport and storage of household waste from Câmpia- Turzii - Suciu M.L.

Collection, transportation and storage of waste in the unfolds in an organized, services were provided by the operator in RADCL Câmpia-Turzii. For improvement and rehabilitation of waste management was developed through a project that rehabilitated the technical and material existence and were built new collection point. In the processing of solid household waste municipality Câmpia-Turzii was purchased a compositing Power Pack. This system creates pressing waste in the form of cylindrical ballot, after they are in field, to remove damage that can occur during storage. Rehabilitation of the collection, transportation and storage lead to further improvements in term of qualitative and quantitative indicator of life from people around. The technical materials were improvement through the purchase of performance equipment and space from selective collection. Waste can be stored long term without leaks and there is no material change the subject of rolling press-sheet packing in sealed and waterproof.

Community strategies in waste management - Tămas C.

The most effective solution for reducing waste and residues is prevention, which can be encouraged through the manufacture of products with "long life". By substituting hazardous components with those of certain hazardous used products, can reduce the amount of stored hazardous waste for public health and of course the environment's health.

Through prevention, reduction, reuse and recycling, waste stream should ideally be reduced to such a level that is no longer needed storage space final (landfill) or even that space requirements and therefore costs money and environmental should be minimized. Landfills should be reduced in favor of the collection as waste disposal do not present a viable way of managing municipal waste in the context of population growth. A special attention should be paid to possible ban on final disposal by landfilling of recyclable materials. Prevention is the priority of environmental management, discharge is the final option.

Packaging waste – secondary raw materials and a cleaner environment - Toderic L.

In order to stop pollution caused by packaging waste, the European Commission decided to draw up the Order 96/26/CE which is meant to reduce the quantity of waste. In Romania, the packaging waste comes in a proportion of 60 % from citizen and 40 % from economic agents. In 2007, 661.021 t of packaging materials were released on the market and after that, 35.908 t of glass, 40.989 t of plastic and 121.641 t of paper waste were recycled. Until 2015, separate systems for collecting waste will have to be introduced, especially for waste made of glass, paper, plastic, cloth, and metal. Until 2020, the waste that can be recycled will have to be removed from the places where it will be unloaded.

The effect of using fertilizers on surface and subsurface water quality – experimental study - Vasiu N., A. G. Voloşii, M. Ţurcanu, A. Toma.

Mineral and organic fertilizers are highly used in industrialized agriculture. Besides the benefits of using it, they can also lead to some environmentally negative effects. Concerning soil productivity and fertility nutrients leaching is the most often discussed. The present study tried to assess the risk of nutrients leaching when three different types of fertilizers were used: urea, NPK complex and cattle manure. The study was conducted in microcosmos experiments with two earthworm species, i.e. *Lumbricus terrestris* and *Aporrectodea caliginosa*. The highest amount of soil nutrients loosed by leaching has been registered when urea and NPK complex was used whilst cattle manure have similar values to control treatment.