

Food, agriculture and the environment

[Science](#), [Agriculture](#)



FOOD, AGRICULTURE AND THE ENVIRONMENT FINAL EXAM Important Notice!

Please make sure you type your name (first and last) the way you want it to appear on your certificate.! Name the word document containing you exam answers and evaluation form with your last name.! Send your final exam and evaluation form as a word document only to bios@otenet. gr | Final exams must be e-mailed to bios@otenet. gr no later than Monday, February 4, 2013. Please provide short answers to the following questions: 1. How do agricultural activities affect the quality of the environment? Please provide three examples in your answer. (up to 6 lines) Fertilizers & pesticides and destruction of habitats have caused a major extinction event, lowering global biodiversity and changing ecology. Farming contributes to air & water pollution and is responsible for app. 9% of greenhouse gas emissions. For example, in the Nile basin, water diversion for irrigation caused fish species to be extinct or endangered; Lake Chad shrank from 25. 000 sq. km. to 2. 000; in the Gulf of Mexico a " dead zone" was formed, due to the Mississippi Delta agricultural runoff. 2. What is the significance of urban agriculture in meeting world food requirements? (up to 8 lines) The world's population is becoming increasingly urban and this trend is especially pronounced in countries under development. Valuable agricultural lands are being lost due to urban expansion. Urban agriculture can meet a percentage of metropolitan urban dwellers' food needs within urban areas and the UN's Food and Agricultural Organization FAO estimates that 200 million urban farmers supply food to 700 million people. There are plenty of initiatives of urban agriculture (eg Berlin, London, New York city, that need to be promoted and protected. Attention is necessary for dangers from

contaminated water or sewage. 3. Which agricultural activities cause water pollution and what are the difficulties in controlling water pollution from agriculture? (up to 6 lines) Agricultural pollution results from the use of fertilizers and pesticides, soil erosion and animal feedlots. The difficulties in controlling water pollution from agriculture are that it occurs over a wide area and it enters the waterways in many locations. As in the case of improving irrigation practices, controlling agricultural water pollution requires technical staff to work with the farmers so that they may adopt practices that limit the adverse effect of farming on water quality. 4. What should the objectives of a complete systems approach to agricultural waste management include? (up to 6 lines) The objectives of a complete systems approach should include designing it so that it recycles nutrients in plant-benefiting quantities, builds levels of soil organic matter, limits nutrient or harmful contaminant movement to surface and ground water, doesn't contaminate food crops with pathogens or toxic concentrations of metals or organics, and provides a method in the soil environment to fix or transform nonessential elements & compounds into harmless forms. 5. Is the application of biotechnology to agriculture a new concept? How does today's biotechnology differ from ancient practices? (up to 6 lines) No. For centuries, farmers have culled their seeds to produce a better strain of crop using fermentation to produce bread, cheese & beer. They crossbred strains of crops to achieve improved characteristics, mixing genes of similar or identical species, while today biotechnology removes genes from one animal or plant species and inserts them into another species to replicate the desirable characteristics, such as resistance to insects, herbicide tolerance or

higher yields. 6. Can biotechnology be applied to support small-scale farming? (up to 6 lines) Transgenic crops, especially those with resistance to biotic and abiotic stress factors, fit well into small-scale farming systems and can easily be integrated without adjusting traditional cropping practices. However, biotechnology could also bring forth new crop traits that are not amenable to the conventional approach. The use of Bt crops, for example, can be problematic for small farmers in developing countries, while preventing rapid ripening and softening of fruits and vegetables is very helpful. 7. Why is genetic diversity important to agriculture and how does organic farming help to conserve genetic diversity? (up to 6 lines) Genetic diversity is significant in agriculture because when genetic diversity is weakened, the system becomes less complex and less sustainable, which in turn may lead to the introduction of new bacteria and viral or other strains throughout the agricultural system. Organic farming conserves local plant genetic resources and ensures the evolution of these resources through a respect for traditional farming practices. Consequently, it favors locally adapted seeds and varieties. 8. How do forests benefit agriculture? Please provide three examples in your answer. (up to 6 lines) Forests can influence local rainfall, wind patterns & temperature variations; they can reduce soil erosion; they can help maintain soil fertility through recycling nutrients and maintaining soil organic matter; they can harbor agricultural pests & diseases, or the natural predators of these pests. Forests, through agroforestry, improve economic returns for farmers, as in the Guatemalan community of Uexactun with xate, in north-eastern Honduras with mahogany and in South Konawe, Indonesia, with teak. 9. How can agriculture prevent

rural environmental degradation? Please provide two specific examples in your answer (up to 6 lines) Rural environmental degradation can be prevented if environmental protection is factored into all recommendations & programs concerning agricultural development. Agricultural production must become more sustainable both in developed and less developed countries, by improving agricultural water management with water-saving irrigation technologies, such as drip irrigation, and promoting sustainable agriculture, using measures such as conserving the organic material in soils. 10. Does biofuel production help or compromise food security? (up to 6 lines) Biofuel production that does not depend on food crops could help reduce pressure on the food supply & create a new market for producers as well as offer new forms of employment that will positively affect agricultural and rural incomes, poverty education & economic growth. Still, the right policies have to be in place so that bio-fuel production does not crowd out staple food crops or cause unnecessary pressure on the environment due to natural resource scarcity & intensive agricultural production. Please email your answers (final exam and evaluation form) to bios@otenet.gr no later than Monday, February 4, 2013.