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READING COMPREHENSION

AGRICULTURAL TOPICS

1. Finnish Forests
Major Research Projects

Research forms are essential components of life at a science university. This also applies to Helsinki University. Despite the availability of research grants from private Funds and the State, the university has deemed it necessary to use some of its own resources to support research. A special University of Helsinki research fund has been in existence for the past ten years.

A large proportion of the money awarded by the university is given for long-term research generally spanning three years. Grants have been awarded to methodologically innovative projects oriented towards topics of current scientific issues.

Professor Emeritus M. Nuorteva and J. Tomminen, M.Sc. have been studying the dispersal mechanisms and biology of nematodes destructive to Scots pine forests. As a spin-off there has been a good deal of cooperation between the team and scientists working at the University of Vermont in the US.

Nematodes affecting the Finnish forests

The North American pine wood nematode was first discovered in imported wood chips in Finland in 1984. Barely visible to the naked eye, this tiny organism is infamous for having caused widespread damage to pine forests in other countries, including Japan, to which it has inadvertently been dispersed. In North America, the nematode is harmless to local species of pine.

To prevent its spreading into the pine forest of Finland and other parts of Europe, an embargo has been placed on the importation of fresh coniferous sawn goods and ground wood from those places where the pests occurs. This has caused a quarrel in the trade sector at a time when the general tendency is to do away with barriers in international trade.

Research data on the spread of the nematode and its chances of surviving in Finnish conditions was needed to establish exactly how dangerous the organism could be to our Scots pine forests. At the time, however, there was no expert available in Finland specialized in forest nematodes. With financial backing from the Academy of Finland and the Research Foundation for Finnish Natural Resource, Finnish researcher J. Tomminen was able to visit the US and Canada for special training in this aspect of forest zoology. The expertise he gained was used as a launching point for a study in Finland, and this is where the University of Helsinki, as a source of funds, was able to help out.

Tomminen's work revealed that the nematode was being transmitted to Finland in imported sawn goods, it was not an indigenous species. The pest is dispersed to fresh hosts by insect vectors. According to the researchers, the pine wood nematode is able to survive well in Finnish environmental conditions. In experiments it was found that even severe frosts did not kill the worms, which were perfectly capable of surviving for months at minus 40 ^{o}C. On the other hand, their relative thermal resistance is rather low. Thus, the most practical and ecological way of eradicating these pests proved to their destruction by a heat treatment.

Due to plant protection regulations in Finland the research team was not permitted to carry out experiments on the nematode in the wild so they were unable to state categorically one way or the other whether the species could kill trees in a Finnish environment. International contracts established in the course of the study – particularly with the University of Vermont – ensure the continuation of these studies.

Task 1
Read the text again and use it to decide if the statements are true (T) or false (F). Write your answers in the table below according to the example (0). Please note that if all your answers are marked as true or as false, your answers will be disqualified.

STATEMENTS	**TRUE OR FALSE**
0. Helsinki University supports research projects jointly with the governmental and private sources	T
1. Finnish research on the spread of nematodes is carried out with the leadership of the University of Vermont.	
2. In Japan nematodes caused more damage than in North America.	
3. The nematode is a pest, which is just the size to be able to see it without a microscope.	
4. Tomminen's expertise in nematodes made it possible to launch this project.	

Task 2
Read the text and complete the table with your short notes (based on the text) with no more than 3 words, according to the example (0).

CAUSE	**EFFECT**
0. Import of wood chips	**Nematodes spreading into pine forests**
5. Infection in pine forest	
6.	Caused debate in world trade
7. Insects hosting by pine trees	
8. Nematodes being placed under freezing conditions	
9.	Can kill the pests
10.	Help to continue the project

2. Let's keep the genie in its bottle

Sue Mayer considers a matter of some genetic import

0. ENVIRONMENTALIST are back at the barricades, blockading ports to stop the import of genetically engineered crops. Their actions should come as no surprise. The regulations governing genetically engineered products are woefully out of touch with people's concerns. Monsanto' herbicide-resistant soya bean is the first target but protests are sure to continue. The crux of the problem is that the government interprets European regulations to exclude or discount most of the things people worry about. No one is happy with them, neither regulators, environmentalists or industry.
1. All requests to the European Union for consent to market genetically modified organisms (GMOs) have been disputed by some of the member states. Recently Britain objected to Ciba-Geigy's proposal to import genetically manipulated corn because it contains resistance gene to the commonly used antibiotic, ampicillin. Britain says that problems with bacterial resistance could increase if the corn is used and so a ban on its import is possible. The US claims that the corn is safe and a trade war looms if Europe decides to exclude it. A decision is due in December.
2. But even when Europe has taken a decision it does not have public confidence. The EU says Monsanto's genetically engineered herbicide-resistant soya bean is safe, is identical to the traditional soya bean and does not need segregation or labelling. Yet Greenpeace activists blockaded shipments of beans at Ghent and Antwerp. Environmentalists protest that the beans mean more herbicide use, genetic pollution threats to health. Consumer organisations say at least people should have the choice.
3. So why is there such a mess? The problem stems from the way boundaries are set and judgements made. It is only the characteristics of the GMO that are taken into account in the EU's risk assessment. The underlying assumption, especially in Britain and France, is that genetic engineering in agriculture is a positive step and that any influence on agricultural practices (such as more herbicide use) is not part of the risk evaluation of the GMO. Northern European countries, such as Denmark, take a broader view of the risks and include effects on agricultural land and practices in evaluating GMOs.
4. Britain considers Ciba-Geigy's genetically engineered corn as a real risk, because of the horizontal gene transfer between plants and bacteria. If the corn were processed before use, as Monsanto's soya bean will be, Britain's objection would vanish. Regulators say Monsanto's soya bean is safe because it is "substantially equivalent" to natural soya bean. Substantial equivalence is an OECD concept used to decide if things are sufficiently different to raise concerns over safety or labelling. It compares the chemical composition of novel foods with their natural counterparts. But the soya bean has unquestionably been genetically engineered, contains foreign genes and produces a novel protein. Unexpected food allergies cannot be ruled out. This together with the likelihood of increased herbicide use and perpetuation of intensive agriculture has led environmentalists to a different conclusion. Genetically engineered soya bean is not the same as traditional soya bean. Laboratory tests of "substantial equivalence" do not pick up what may prove to be the most critical difference.
5. As long as the genetic engineering regulations do not encompass people's concerns, they will not gain public confidence. The EU's regulations covering release of GMOs were intended to be precautionary. But rather than taking on board the human desire to protect the environment for future generations, the way in which regulations have developed has been too technical in nature and has not responded to the shortcomings in science-based risk assessment.
6. So the environmentalists' blockades against genetically engineered products will remain while the regulators remain unaware of their value judgements and commitments in the decisions they take. They argue that the market place will determine need and benefit then cut off opportunities for choice. It's a recipe for conflict.

Task 1
Read the article and match the subtitles with the correct paragraphs. Write your answers in the table according to the example (0). There is one extra heading you don't need to use.

A. reaction of the public to the import of GM soya
B. debates over gene transfer and the concept of substantial equivalence
C. solutions to the current crisis
D. environmentalists' protest at the harbours
E. conflicting values and interests
F. lack of trust in the GMO regulations and its reasons
G. different interpretations of how risks of GMO imports should be assessed
H. worries about marketing GMOs in Europe

0	1	2	3	4	5	6
D						

Task 2
Read the text again and complete the table with your short notes (based on the text) with no more than 3 words, according to the example (0).

WORRIES	**POSSIBLE CONSEQUENCES**
the import of GM corn	**0.** ***increase of bacterial resistance***
using GM corn without processing	7.
GM foods' novel proteins	8.
	9.
An effect of GM produce on agriculture	10.

3. Onions at Wisley

Guy Barter describes the methods of growing onions in the Model Vegetable Garden.

0. Onions are an essential crop for many gardeners, and are grown every year in the Model Garden of Wisley. It is difficult to grow onions well in Britain because of our climate. There is often insufficient summer warmth and light to grow reliable crops from seeds sown directly in the ground in spring, except in the south of the country.
   While the trials field at Wisley is such a site, the Model Vegetable Garden has heavy soil, faces north and is typical of the less-favoured conditions faced by many home gardeners. To overcome these far from ideal conditions, the onion crop here is raised from transplants, onion sets and from overwintered plants.
1. Traditionally onions are grown in rows, spaced 5 to 15cm apart, with 30cm between the rows. In general, the wider the spacing, the larger the bulb, but there will be less of them. Onions can be grown more closely in the deep bed system. The paths between the 1.2m wide, deeply dug beds, acts as extra space between the blocks of crops and provide additional light. Onions are spaced 15cm apart –any less and weeding is difficult.
2. Ground for onions should be well manured in winter, and a general fertiliser such as Growmore is raked into the soil surface before planting, at a rate of 136g per sq m. Although watering maturing bulbs may adversely affect their keeping qualities, the immature plants should not be allowed to dry out. If growth is slow, we topdress with a nitrogenous fertiliser such as sulphate of ammonia at 68g per sq m.
   We do not bend over the leaves of mature bulbs to aid ripening as this is of doubtful value – only enhancing the appearance of the plot. But cloches are used in situ to help ripen the onions, keeping them dry but still well ventilated. However, conditions under the cloches should not be too hot, as this could result in damage to the bulbs. Later on in the ripening process, we lift the bulbs out of the ground with a fork, and leave them on the soil to dry off completely. When fully ripe and dry, the onions are cleaned and stored in cool, airy conditions, either in slatted trays or strung in ropes.
3. Onions are affected by two serious fungal diseases here at Wisley – white rot and downy mildew – so we do all we can to minimise infection. White rot (*Scleroticum cepivorum*) is becoming increasingly common and also attacks leeks, garlic and shallots. The base of the bulb and the roots become covered in a fluffy white fungal growth in which hard, black resting bodies (sclerotia) become embedded. These can persist in the soil for at least 15 years, so the three-year rotation of crops in the Model Vegetable Garden does not prevent infection.
   To reduce levels of infection, affected plants are dug up and disposed of, with a ball of soil around the roots. These should not be composted. If white rot is a problem, avoid growing susceptible crops on the affected site for at least 15 years, except in containers. No chemical treatments or resistant cultivars are available. The disease is spread by contaminated soil on tools, boots and plants.
   Downy mildew (*Peronospora destructor*) favours wet weather from early summer onwards and develops most quickly at 12 ºC. The spores may come from plant debris in the soil or from perennial onions such as Welsh onions. A fluffy or mealy grey/violet fungal growth develops on the foliage, while the leaf is blotched yellow or grey and withered.
   Avoiding overhead watering of densely planted crops is the best method to keep downy mildew in check. Spraying with Bio Dithane 945 fungicide before the disease takes hold, repeating the spraying every fortnight to protect young foliage, is also effective.
4. There are few of them; thrips (*Thrips species*) and onion fly (*Delia antiqua*) are classed as minor ones that rarely cause enough damage to be worth spraying against.

Task 1
Read the article and match the subtitles with the correct paragraphs. Write your answers in the table according to the example (0). There is one extra heading you don't need to use.

A. Introduction
B. Pests
C. Cultivation
D. Diseases
E. Rotation
F. Propagation / planting methods

0	1	2	3	4
A				

Task 2
Read the text again and complete the table with your short notes (based on the text) with no more than 3 words, according to the example (0).

	NOTES
Disadvantages of British climate for onions	**0. not enough warmth**
	5.
Symptoms of white rot	6.
Prevention of white rot	7.
	8.
Symptoms of downy mildew on the foliage	9.
Symptoms of downy mildew on the leaves	blotched yellow / grey, withered leaves
Prevention of downy mildew (give 1 example)	10.

4. Sustainable projects for smallholders

In addition to producing enough food for their families, small farmers in the tropics seek more reliable sources of cash income to meet life's other necessities. Though anxious to increase the productivity of their farms, these people face many obstacles, such as declining soil fertility, increased pest pressures, and reduced availability of water.

The Challenge

Considerable effort has gone into developing new technologies for and with these farmers, but the resulting "packages" of improved crop varieties and new management practices were often not suited to farmers' circumstances. To ensure that innovations are appropriate, it is vital that farmers' perspectives and skills be brought more fully to bear on technology development within the context of whole farming systems. Particular attention must be paid to farmers' concern about minimizing the risks associated with new technologies. Moreover, in addressing problems of natural resource degradation, research must be carried out, not just with individual farmers, but at the community and landscape levels.

Numerous organizations are working to reduce poverty and natural resource degradation in rural communities, but there is a general lack of coordination among them, and many pursue a supply- rather than client-driven approach. Thus, an important challenge is to create frameworks for a multi-institutional, participatory approach that solves farmers' most urgent problems by integrating new crop varieties with improved management practices in agricultural landscapes.

Objective

To develop integrated crop, livestock, and tree technologies that are productive, sustainable, and suited to farmers' circumstances through participatory approaches and in collaboration with national programs.

Outputs

- Integrated land use options that help preserve the natural resource base
- Appropriate technologies for the agricultural environments where CIAT works
- Decision-support guidelines for farmers and researchers at the local level and for planners and policy makers at both the local and national levels
- Training and related support that increases the capacity of national institutions and farmer groups to conduct participatory research on agricultural production systems and components of these systems

Benefits

This project primarily benefits low-income farmers through the development of technologies that enable them to strengthen food security, raise incomes, and protect the natural resource base. Wider adoption of environmentally sound farming practices benefits society as a whole. New options for planners and policy makers strengthen the research capacities of national institutions.

Strategy

Through collaboration with a wide range of partners, this project develops more productive and sustainable technologies that integrate new germplasm with improved

resource management practices. Germplasm drawn from CIAT projects and other sources is incorporated with improved management practices through farmer participatory research, leading to the development of technologies that are suited to farmers' circumstances.

the environment. They analyze trade-offs between private and public costs and benefits to produce a range of options for local and national policy makers. By working closely with national partners and farmers, the project develops more effective models for technology development and institutional collaboration.

This research is carried out by teams at ecoregional benchmark sites and by specific projects, such as Tropileche in Latin America and Forages for Smallholders in Southeast Asia.

Project Partners
International Center for Tropical Agriculture (CIAT), Cali, Colombia: it offers expertise in research on crop improvement and agronomy, livestock production, farmer participatory methods, and soil and watershed management.
Organizations in developing countries: The project works with numerous government and non-government organizations in Latin America (Colombia, Costa Rica, Honduras, Nicaragua, and Peru), Southeast Asia (China, Indonesia, Laos, Philippines, Thailand, and Vietnam), and eastern Africa (Ethiopia, Rwanda, Tanzania, and Uganda).
Other advanced institutions: The International Livestock Research Institute in Ethiopia, International Centre for Research in Agroforestry in Kenya, Australia's Commonwealth Scientific and Industrial Research Organisation, and the Oxford Forestry Institute in the UK provide valuable expertise in research on crop, tree, livestock, and resource management.

Task 1
Read the text and provide short answers to the questions according to the example (0).

QUESTIONS	ANSWERS
What is the main concern for smallholders in tropical countries?	**0. They cannot increase the profitability of their farms.**
What problems occurred in the previous efforts to improve the situation of smallholders in the tropics?	1.
	2.
	3.
What are the elements of the proposed framework for improvement?	4.
	5.
	6.
Who benefits from the project as a result? (Give 1 example.)	7.

Task 2
Read the text again and use it to decide if the statements are true (T) or false (F). Write your answers in the table below according to the example (0). Please note that if all your answers are marked as true or as false, your answers will be disqualified.

STATEMENTS	TRUE OR FALSE
0. Scientists and organisations of five continents take part in the project.	**T**
8. The project outputs and benefits are tailored to the needs of the developing countries in Latin America.	
9. Scientist will recommend models of locally suited innovations and collaboration rather than a combination of new crops and technologies.	
10. Throughout the project, farmers will receive direct financial support to increase their production capacity.	

5. How ‘green’ are our veg?

Quite enough, says G. Hollins, who gives his personal view on why pesticide fears are overdone

0. ……..*Why do you by organic food?…… ……*

Sales are rising, and supermarkets that were sceptical are now actively promoting it. Most organic produce in the UK is imported, so the government is increasing incentives to farmers to convert to organic production. But what is driving consumers in this direction?

It certainly is not greed, because organic food is expensive. Organic fruit and vegetables cost, on average, 40% more than non-organic, according to a recent survey. Shoppers are apparently prepared to pay up to 60% over the odds for organic tomatoes. Sex had not yet been used as a selling ploy for organic foods. Sure enough, a survey by Health Which? In .April 1997 showed that more than 80% of those buying organic food did so to avoid pesticide residues. But is this fear justified?

1. ……

The government monitors these levels in Britain and reports annually on the findings. About 5,000 samples of food are tested for a wide range of pesticides - an example might typically be 10 apples, or a kilo of raspberries. Dietary staples such as bread, milk and potatoes are sampled as well as many types of fruit and vegetables. Even human breast milk is investigated, to see if persistent pesticides are present, but more than 70% of samples show no residues at all. Where they are detected, it is at very low levels. In less than one per cent of samples do residues exceed permitted levels. Even these do not pose any risk to health, according to the committee charged with overseeing the operation. To get a flavour of the findings, look at the results of tomatoes – the vegetables with the highest organic price premium. Only one sample from 22 tested contained a pesticide residue – inorganic bromide, at 14 parts per million (equivalent to 14cm in 10km). This was comfortably below bromide’s permitted level of 75 parts per million (ppm), which itself is well below the danger levels, since large safety factors are built into the calculations. Can these tiny amounts really justify such a large price mark up for organic tomatoes? The hyper-cautious might feel any premium worth paying to guarantee freedom from residues. No such guarantee can be given, even for organic produce. A sample of ‘organic’ celery from Spain contained 5ppm of pirimicarb, a pesticide used against aphids.

2 ……

As a population we are living longer and are healthier than ever, which suggests that our diet is not too bad. The incidence of stomach cancer, which is the type most likely to be caused by pesticides, is falling. Occasionally, a scare story links particular cancers to pesticides, but none have stood up to independent scrutiny. A good example is a recent study claiming that breast cancer is linked to dieldrin, a persistent pesticide long since banished in Britain.

3. ……

Not only was the safety of consumers in general considered, but also that of children, and of those who applied them in undiluted form. Studies were required into potential effects on birds, insects, air, water and soil.

4. ……

Unfortunately there are many sources of scare stories about pesticides, including those who ought to know better. The National Consumer Council published a campaigning document – a chapter on pesticides recycled hoary myths. It did not even mention the UK’s monitoring or its results. The Consumer Association is not better. It printed similar scary material – it said: “Test results from animal studies link high doses of individual pesticides with cancers and hormone disturbances”. True, but high levels of anything will harm you.

5. ……

Some who cannot afford organic food must be worrying unnecessarily about their non-organic purchases. Dieticians universally recommend increasing our intake of fruit and

vegetables, so scares about pesticides must be reducing consumption of these healthy foods. My advice is to eat your greens, but think twice before buying organic food.

Task 1

Read the article and match the sentences with the correct paragraphs. Write your answers in the table according to the example (0). There is one extra heading you don't need to use

A. Why do you by organic food?

B. The advisory committees also keep an eye on trends in illnesses that might spring from pesticides or other residues.

C. Given the regulatory protection and the monitoring, why do some people still worry about pesticide residues?

D. During the late 1980s I saw the care taken over the approval of new pesticides, and I was amazed that any managed to pass the battery of tests required by regulators.

E. All this is sad. Some consumers are buying expensive food for the wrong reasons.

F. In fact, the level of pesticide residue in food is considered very low.

0.	1.	2.	3.	4.	5.
A					

Task 2

Read the text again and provide short answers to the questions according to the example (0), in no more than 3 words.

QUESTIONS	ANSWERS
0. What was the result of the survey by Which? magazine?	**Organic food is more expensive / shoppers are prepared to pay more**
According to the survey, why do people buy organic food?	6.
Why is tomato the most expensive organic vegetable?	7.
What is the most frequent kind of illness caused by pesticides?	8.
What safety requirements were considered to approve new pesticides?	9. 10. 11.
Name two sources of scare stories about pesticides.	12. 13.
Dieticians advice	14. 15.

6. Italy can temporarily ban GM foods but must provide sound evidence of the dangers

The European Court of Justice (ECJ) ruled that Monsanto's GM maize can be placed on the market without Commission authorisation. However, Italy can impose a temporary ban on suspicion of risks.

In its decree from August 2000, Italy imposed a temporary ban of products derived from a particular GM maize variety due to concerns regarding the safety of the product.

The food biotechnology companies Monsanto, Syngenta and Pioneer Hi-Bred subsequently challenged the Italian measure, claiming that it was in breach of Community law.

Genes are inserted into the maize in question to render it resistant to certain herbicides and pests. Although the genetically modified DNA is destroyed during the processing of the maize, Italian scientists found residues of GMO proteins which prompted the Italian government to ban the products.

Monsanto had marketed the maize in Italy under the so-called "simplified procedure", i.e. without seeking the authorisation of the Commission, claiming that the maize was similar to the conventional variety which had already been approved as safe by regulatory authorities. British and French agencies had approved this new variety on behalf of the whole EU.

Following the ruling of the European Court of Justice (ECJ) on 9 September 2003, both sides claimed victory.

The ECJ underpinned Monsanto's choice of the simplified procedure, maintaining that the GM maize could be put on the market without Commission authorisation, as it was substantially equivalent to the conventional variety, and there was no evidence of a risk to consumers. The court said that the detection of transgenic protein did not undermine the simplified authorisation, and was not in itself a basis for banning the product. EuropaBio welcomed the ruling, stating that "no justification on health or environmental safety grounds was provided by Italy to justify the ban."

However, Italy was confirmed in its temporary ban, as the court considered its preventive measures legitimate: a Member State can temporarily restrict or suspend the marketing of foods in its territory if it has a sound reason to suspect that the product is unsafe for humans or the environment. This verdict was welcomed by the Italian government as well as NGOs. "The European Commission has systematically denied the right of Member States to restrict the free circulation of GMOs, even when the reasons invoked are legitimate", said Greenpeace, calling for Member States not to let themselves bully into accepting new GMO products.

Italian courts will now have to rule if there is enough sound scientific evidence of the risks that the maize variety poses to human health or the environment for Italy to sustain a ban. Monsanto predicts that the Italian courts will overturn the ban for lack of evidence.

This court case is part of the scientific and political battle over GM foods in the EU, which NGOs fear could pose risks to human health and the environment. Italy is one of a number of EU Member States upholding an unofficial moratorium on new GMO products, but experts believe that this ban will be lifted early next year.

Task 1
Read the text and decide which statements belong to which organisation(s), according to the example (0).

	ECJ	**Italy**	**Greenpeace**	**Monsanto company**
0. Local scientists found residues of GMO proteins		✓		
1. Marketed its maize without authorization of the Commission				
2. Established that the detection of GMO proteins in itself cannot be a reason for banning GM maize				
3. Criticize the strategy of European Commission concerning acceptance of GMO products				
4. Temporarily suspended the marketing of products derived from a special GM maize variety				
5. Predicts that local courts will overturn the temporary ban				
6. Ruled on the placement of GM maize on the markets of EU Members				
7-8 Claimed victory after the court ruling				

Task 2
Read the text again and provide short answers to the questions according to the example (0).

QUESTIONS	**ANSWERS**
0. When was a temporary ban imposed on GM maize that caused serious arguments in the EU?	**August 2000**
9. Why are genes inserted into the maize?	
10. What kind of procedure was used for placing GM maize in Italy?	
11. What was the primary reason of imposing temporary ban of products derived from a particular GM maize variety?	
12. How can the GM maize be marketed without Commission authorization on the territory of EU members?	
13. What does Greenpeace advice Member States regarding acceptance of new GMO products?	
14-15. What type of conflicts have appeared in the EU over GM foods?	

7. CU and USDA: Cattle feeding change could cut E. coli risk

Cornell researchers, Todd Callaway, Francisco Diez-Gonsalez, James B. Russell and Menas Kizoulis have found that hay spells acid relief for cattle believed to be a source of acid-resistant E. coli bacteria.

A simple change in cattle diets in the days before slaughter may reduce the risk of *Escherichia coli* (*E. coli*) infections in humans, U.S. Department of Agriculture (USDA) and Cornell microbiologists have discovered.

Research reported in the Sept. 11 issue of the journal *Science* indicates that grain-based cattle diets promote the growth of *E. coli* that can survive the acidity of the human stomach and cause intestinal illness. *E. coli* contamination is responsible for more than 20,000 infections and 200 deaths each year in the United States.

Fortunately there is a workable solution to the food-safety problem, the scientists say. By feeding hay to cattle for about five days before slaughter, the number of acid-resistant *E. coli* can be dramatically reduced.

"Most bacteria are killed by the acid of stomach juice, but *E. coli* from grain-fed cattle are resistant to strong acids," explained James B. Russell, a USDA microbiologist and faculty member of the Cornell Section of Microbiology. "When people eat foods contaminated with acid-resistant *E. coli* -- including pathogenic strains like O157:H7 -- the chance of getting sick increases."

E. coli is a normal bacterium in the gastrointestinal tract of animals and humans, and most types are not harmful. However, disease-causing strains, such as *E. coli* O157:H7, produce toxins that cause bloody diarrhea or even kidney failure in humans. Mature cattle are unaffected by *E. coli* O157:H7. Only a small number of cattle (estimated at 1 to 2 percent at any one time) shed *E. coli* O157:H7 in their feces, a rate that is not fully explained.

When beef carcasses are accidentally contaminated by feces at slaughter, the pathogens can enter the human food supply. *E. coli* O157:H7 can be killed by cooking or irradiation, but the bacterium continues to pose a food-safety risk.

Cattle are fed starch-containing grains to increase growth rate and produce tender meat. Because the bovine gastrointestinal tract digests starch poorly, Russell explains, some undigested grain reaches the colon, where it is fermented. When the grain ferments -- and acetic, propionic and butyric acids accumulate in the animal's colon -- a large fraction of *E. coli* produced are the acid-resistant type.

"Grain does not specifically promote the growth of *E. coli* O157:H7, but it increases the chance that at least some *E. coli* could pass through the gastric stomach of humans," Russell said. "The carbohydrates of hay are not so easily fermented, and hay does not promote either the growth or acid resistance of *E. coli*. When we switched cattle from grain-based diets to hay for only five days, acid-resistant *E. coli* could no longer be detected."

In studies performed at Cornell, beef cattle fed grain-based rations typical of commercial feedlots had 1 million acid-resistant *E. coli*, per gram of feces, and dairy cattle fed only 60 percent grain also had high numbers of acid-resistant bacteria. In each case, the high counts could be explained by grain fermentation in the intestines.

By comparison, cattle fed hay or grass had only acid-sensitive *E. coli*, and these bacteria were destroyed by an "acid shock" that mimicked the human stomach, the microbiologists report in *Science*.

Further research is needed to identify the acid-resistance genes of *E. coli*, but Russell said that "common laboratory strains" of *E. coli* appear to lack the necessary DNA to survive acidic gastrointestinal environments.

"In the meantime, now that we know where the acid-resistant *E. coli* are coming from, we can control them with a relatively inexpensive change in diet," Russell said. "This strategy has the potential to control the production of other acid-resistant bacteria, including virulent strains of *E. coli* that have not yet evolved."

A brief period of hay-feeding immediately before slaughter "should not affect either carcass size or meat quality," and the diet change could be implemented with minimal expense and inconvenience to feedlot operators, according to Donald H. Beermann, Cornell professor of animal science.

Task 1

Read the text and choose the answer/ the option that best fits the text, according to the example. (0).

0. The research has been carried out by

A. famous researchers of Cornell University.

B. <u>microbiologists of Cornell University and USDA.</u>

C. staff of the Science monthly journal.

1. Grain-based feeding of cattle
   A. causes severe intestinal illness in the human stomach.
   B. causes the growth of *E. coli* O157:H7 in all cattle examined.
   C. promotes growth of acid-resistant E-coli strains in cattle.

2. Pathogenic *E coli* strains
   A. can be found in the organism of humans normally.
   B. have toxins which cause diseases in humans.
   C. can be eliminated only by radiation.

3. *E coli* can be transmitted to humans
   A. through feces at slaughter.
   B. through blood at slaughter.
   C. through genes in laboratory experiments.

4. The reason for feeding grain to cattle is
   A. to avoid the fermentation of hay in their intestines.
   B. to avoid the formation of acid-sensitive strains of *E coli* in their intestines.
   C. to increase the size of their carcass and quality of meat.

5. Feeding hay to cattle before slaughter
   A. does not reduce the quality of their meat.
   B. increases the costs of feedlots considerably.
   C. prevents cattle from gaining further weight.

0	1.	2.	3.	4.	5.
B					

7. CU and USDA: Cattle feeding change could cut E. coli risk (CONTINUATION)

Cornell researchers, Todd Callaway, Francisco Diez-Gonsalez, James B. Russell and Menas Kizoulis have found that hay spells acid relief for cattle believed to be a source of acid-resistant E. coli bacteria.

A simple change in cattle diets in the days before slaughter may reduce the risk of *Escherichia coli* (*E. coli*) infections in humans, U.S. Department of Agriculture (USDA) and Cornell microbiologists have discovered.

Research reported in the Sept. 11 issue of the journal *Science* indicates that grain-based cattle diets promote the growth of *E. coli* that can survive the acidity of the human stomach and cause intestinal illness. *E. coli* contamination is responsible for more than 20,000 infections and 200 deaths each year in the United States.

Fortunately there is a workable solution to the food-safety problem, the scientists say. By feeding hay to cattle for about five days before slaughter, the number of acid-resistant *E. coli* can be dramatically reduced.

"Most bacteria are killed by the acid of stomach juice, but *E. coli* from grain-fed cattle are resistant to strong acids," explained James B. Russell, a USDA microbiologist and faculty member of the Cornell Section of Microbiology. "When people eat foods contaminated with acid-resistant *E. coli* -- including pathogenic strains like O157:H7 -- the chance of getting sick increases."

E. coli is a normal bacterium in the gastrointestinal tract of animals and humans, and most types are not harmful. However, disease-causing strains, such as *E. coli* O157:H7, produce toxins that cause bloody diarrhea or even kidney failure in humans. Mature cattle are unaffected by *E. coli* O157:H7. Only a small number of cattle (estimated at 1 to 2 percent at any one time) shed *E. coli* O157:H7 in their feces, a rate that is not fully explained.

When beef carcasses are accidentally contaminated by feces at slaughter, the pathogens can enter the human food supply. *E. coli* O157:H7 can be killed by cooking or irradiation, but the bacterium continues to pose a food-safety risk.

Cattle are fed starch-containing grains to increase growth rate and produce tender meat. Because the bovine gastrointestinal tract digests starch poorly, Russell explains, some undigested grain reaches the colon, where it is fermented. When the grain ferments -- and acetic, propionic and butyric acids accumulate in the animal's colon -- a large fraction of *E. coli* produced are the acid-resistant type.

"Grain does not specifically promote the growth of *E. coli* O157:H7, but it increases the chance that at least some *E. coli* could pass through the gastric stomach of humans," Russell said. "The carbohydrates of hay are not so easily fermented, and hay does not promote either the growth or acid resistance of *E. coli*. When we switched cattle from grain-based diets to hay for only five days, acid-resistant *E. coli* could no longer be detected."

In studies performed at Cornell, beef cattle fed grain-based rations typical of commercial feedlots had 1 million acid-resistant *E. coli*, per gram of feces, and dairy cattle fed only 60 percent grain also had high numbers of acid-resistant bacteria. In each case, the high counts could be explained by grain fermentation in the intestines.

By comparison, cattle fed hay or grass had only acid-sensitive *E. coli*, and these bacteria were destroyed by an "acid shock" that mimicked the human stomach, the microbiologists report in *Science*.

Further research is needed to identify the acid-resistance genes of *E. coli*, but Russell said that "common laboratory strains" of *E. coli* appear to lack the necessary DNA to survive acidic gastrointestinal environments.

"In the meantime, now that we know where the acid-resistant *E. coli* are coming from, we can control them with a relatively inexpensive change in diet," Russell said. "This strategy has the potential to control the production of other acid-resistant bacteria, including virulent strains of *E. coli* that have not yet evolved."

A brief period of hay-feeding immediately before slaughter "should not affect either carcass size or meat quality," and the diet change could be implemented with minimal expense and inconvenience to feedlot operators, according to Donald H. Beermann, Cornell professor of animal science.

Task 2

Read the text again and provide short answers to the questions according to the example (0).

QUESTIONS	ANSWERS
Which strain of E. coli bacteria can cause illnesses in humans?	**0. E. coli o157:H7**
What kind of illnesses can these bacteria cause in humans?	6.
	7.
Why aren't these bacteria killed by the stomach juices of cattle?	8.
What happens to the undigested grain in cattle?	9.
	10.
	11.
What are the advantages of feeding hay to cattle in the last few days before slaughter?	12.
	13.
At what age cattle are prone to being infected by E-coli?	14.
Which part of the bacteria is responsible for their acid-resistance?	15.

8. Septoria lessons for this season

A combination of very high disease pressure, weather-related spray timing issues and a reliance on azoles at insufficient doses has been responsible for the control problems that many growers have experienced with septoria in 2015. That's according to Bill Clark, commercial technical director with NIAB TAG.

"The panic and disbelief has almost subsided now and people have accepted their fate," he says. "But there are some key messages to get across and discuss with growers, as some valuable lessons have been learned."

The first of these is that this season has been exceptional for septoria disease pressure, he says. "It's been much higher than we've seen for many years. It's almost as though we'd forgotten what can happen when the weather conditions work in the disease's favour and against its control methods."

The idea that many people forgot the basics about the disease leads Mr Clark to another important point. "The septoria population has been drifting to less sensitive types for several years, but this was forgotten when fungicide programmes were being planned and applied. "Growers didn't adjust their inputs to take account of this loss of activity, which is known to affect even the best septoria fungicides."

As a result, the most popular straight triazoles - epoxiconazole and prothioconazole - have looked very ordinary in such a tough season. "And that's the case regardless of whether they've been used at high doses or not. They were up against it right from the start."

There's also no doubt that the T0 and T1 sprays played a crucial role this season, continues Mr Clark. "Where they were missed, or applied late, the disease was able to spread rapidly up the plant. The use of a low rate of triazole plus Bravo just wasn't enough to contain the problem, even though it had done the trick for the last few years."

However, Mr Clark says that timely, robust applications at these two timings seem to have made a big difference.

The commercial availability of the SDHIs has certainly helped, he says. "The trials performance of the three SDHI fungicides - Adexar, Aviator and Seguris - looks exceptionally good where they were used at T1 and T2. The addition of an SDHI at T1, when compared to straight triazoles, has given much better septoria control. So that's something to consider for future seasons, especially where disease pressure is high. But SDHI use must remain within the agreed guidelines."

The rainfall pattern created further challenges, says Mr Clark. "The rain meant that we had almost continuous infection pressure throughout April and early May." This meant that leaf two got infected as it was emerging at the end of April. "We then had cool conditions, so it took nearly four weeks before the flag leaf emerged. As a result, leaf two was already showing symptoms."

In many areas, this resulted in a T1-T2 gap which was too long. "If you were advised to spray a pre-T2 fungicide to protect leaf 2 and did so, it made quite a difference and the situation was less serious," says Mr Clark.

Rates were generally too low, he continues. "We started the season with the threat of drought, which tends to result in low disease levels. By the time people realised that this had changed and there were high levels of disease, it was almost too late. Putting high rates on the flag leaf couldn't retrieve the situation."

While the SDHIs have served growers very well this year, with high doses looking very good, the use of low doses has looked very ordinary, reports Mr Clark. "Where a low rate SDHI was mixed with another azole, it hasn't been a great result. That's even more so where timings were poor and the gap between T1 and T2 was stretched."

In summary, he highlights high disease pressure, poor spray timings and use of azoles at low rates as contributing factors. " However, in just one season, the SDHIs have become essential for good septoria control, he stresses.

Task 1
Read the text and choose the answer/ the option that best fits the text, according to the example. (0).

0. Septoria is .... *a.) fungal disease.*
b.) a harmful insect.
c.) a fungicide.

1. The aggressive spread of septoria this season can be attributed to.....
   a) the wet weather.
   b) inadequate fungicide programmes.
   c) the interaction of several causes.

2. This season farmers forgot to.....
   a) to plan good fungicide programmes.
   b) to use the traditional protection methods.
   c) to use resistant plant varieties.

3. The main problem with the wet weather was .....
   a) the drought.
   b) continuous rainfall in the spring.
   c) the drought followed by continuous rain.

4. SDHIs were the most useful this year when applied .....
   a) in high doses, with short gaps between the applications.
   b) in low doses, in itself.
   c) in low doses, mixed with another azole.

5. In most of the affected areas .....
   a) the time gap between applications was not a significant factor in the spread of the disease.
   b) the T1-T2 application gap was too long.
   c) leaf two was usually not infected when it emerged.

0.	1.	2.	3.	4.	5.
a					

8. **Septoria lessons for this season (CONTINUATION)**

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Task 2
Read the text again and complete the table with your short notes (based on the text) with no more than 3 words, according to the example (0).

	NOTES
position of Bill Clark with NIAB TAG	*0. commercial technical director*
characteristics of this season, with regards to septoria	6.
twofold effect of the weather conditions	7.
	8.
previous tendency of spread of septoria	9.
mistake of farmers with regards to - type - quantity - timing of fungicides	10.
	11.
	12.
the most useful chemicals for treating septoria	13
a successful timing pattern for the second application	14.
a late, failed attempt save the crop	15.

9. Waste Not, Watt Not

While governments are trying to figure out how to control cow burping, a significant factor in global warming, cow manure is gaining popularity as one of Earth's greenest sources of electricity.

Many United States farmers already know the meaning of "cow power." They collect the methane given off by fermenting cow manure and use it to generate electricity. The procedure is relatively simple: manure is stored in huge tanks — anaerobic digesters — which are deprived of oxygen and kept at temperatures of 100°F. The conditions are designed to let anaerobic bacteria thrive and do the work of breaking the manure down. The large volume of "biogas" released — which contains about 90% methane — is piped to an engine which burns the gas and uses the heat energy to generate electricity. The leftover manure is compressed; fluid is drained away and used as fertilizer; and the solids are dried out and used as bedding for the herd and compost.

The method offers a neat solution to the manure waste problem. America's 100 million cattle produce their fair share of manure. By using manure in this way, farmers are transforming problematic waste into new, useable commodities.

With a large enough operation, farms can produce enough electricity to meet their own needs — and generate a surplus which they can sell to local power providers. That's exactly what the Haubenschild family is doing on its dairy farm in Princeton, Minnesota. Their herd of 930 Holsteins produces enough manure to meet the farm's electricity needs and the excess energy they generate serves some 80 homes in the area.

According to Environomics, a company that manufactures manure-digesters, 32 farms in the United States are using the digesters for electricity-generation. The technology has not been more widely adopted because the systems are expensive to install, costing from $200,000 to $1,000,000 each, depending on the size of the herd. To encourage farmers to generate their own electricity, the state of California's Energy Commission is making $10 million in funding available to support farmers' initiatives. It is currently reviewing about 30 applications for grants and plans to install several digesters by this summer.

The average cow burps 280 liters of methane per day. Because of the large quantity of gas generated in its stomach, burping performs a vital biological function for the cow. Billions of bacteria are busy at work in the cow's rumen (the first of the four chambers in its stomach), breaking down grass and hay. One of the anaerobic bacteria produces large quantities of methane as a byproduct, which the cow gets rid of by burping.

While manure-derived methane is proving very useful, the methane cows burp is causing problems. Methane is a greenhouse gas and, in the atmosphere, contributes to global warming. Cows burp an abundant supply of it every day — about 280 liters per animal (in other words, the average cow could fill 140 two-liter soda bottles with gas daily). Unfortunately, burped methane is more difficult to collect, with the result that about six million metric tons of it float blissfully up into the atmosphere every year. And that's just from herds in the United States. (Worldwide, ruminant livestock — including cattle, sheep, goats, and buffalo — produces about 80 million metric tons of methane per year, accounting for 22% of anthropogenic methane emissions.) In New Zealand, some sheep are wearing face masks so that scientists can monitor their burps. (The country has 3.7 million people, but 50 million sheep.)

Task 1
Read the text and complete the table with your short notes (based on the text) with no more than 3 words, according to the example (0).

	NOTES
Amount of manure produced by cows	*0. 48,000 pounds per day*
Cows produce methane in the form of	1.
	2.
The advantage of „cow power technology”	3.
The disadvantage of "cow power technology"	4.
The difficulty of utilising methane from ruminants’ burp	5.
The environmental problem burped methane contributes to	6.

Task 2
Read the text again and use it to decide if the statements are true (T) or false (F). Write your answers in the table below according to the example (0). Please note that if all your answers are marked as true or as false, your answers will be disqualified.

STATEMENTS	**TRUE OR FALSE**
0. Cow manure is one of the Earth's greenest sources of electricity	***T***
7. Anaerobic bacteria in manure release biogas.	
8. Cow manure is burnt to generate electricity.	
9. Methane produced in the cow's gut can be used for electricity generation.	
10. There are attempts to measure the amount of methane burped by sheep.	

10. Wheat that's tailor-made for your farm

Developing a wheat population that's unique to your ground could boost yields and strengthen crops against environmental stress and disease

Virtually all farmers now grow wheat as a mono-culture. This way one can cover big blocks of land with the crop. While this gives the grower a uniform stand and even performance, it also means the crop is more vulnerable to pressures such as drought or flooding as well as disease. With climate change an increasing concern for growers, the ability to produce a crop that will endure extremes such as seasonal droughts, heatwaves and torrential rain is bound to be of interest.

In a joint **DEFRA-funded** project between **The Arable Group** and the **Organic Research Centre,** scientists investigated whether increased genetic diversity within the crop would boost performance. To do this, three mixed wheat populations were created from 20 parent varieties, including both modern and older breeds. A quality milling population was created using 12 of the higher protein varieties such as Hereward, and a high-yielding feed population was produced from nine of the parents. A further "all-rounder" was produced using all 20 parents.

These populations should not be confused with variety mixtures, says the Organic Research Centre's Thomas Döring. A mixture consists of several different varieties, while in a population varieties are crossed to produce a crop in which almost every plant is genetically different, he says. "They are much more diverse than variety mixtures."

These populations were grown alongside standard monocultures and the offspring were re-sown in the same field year after year. In the resulting crop virtually every wheat plant was genetically unique, says Dr Döring. "By comparing these populations with their parents, we could test whether genetic diversity had any effect on yield."

The results were consistent with expectations and showed that the populations exhibited greater yield stability than the monocultures. "This strongly suggests that sowing a crop where the individual plants display different genotypes is a way to stabilise yields."

The fact that populations out-yielded the average of their respective parents was particularly interesting, he adds. "One reason for this could be that varying plants heights allow the crop to absorb more light."

Evidence from previous experiments suggests that increasing genetic diversity within the field will also give better disease resistance.

Less disease

"We know from experiments with variety mixtures that genetic variability reduced disease impact on the crop. For example, a disease that affects one genotype in particular will have less impact where there are many genotypes in the same field."

His colleague, Martin Wolfe, says that the findings could have important knock-on effects for farmers and seed breeders.

"A key feature of these wheat populations is their ability to change over time. If some of the harvested crop is saved for seed, the crops that have fared well will contribute more to the following season's seed. By sowing and re-sowing the population year after year, a farmer will slowly build a wheat crop that is more adapted to local farm conditions such as weather, altitude, aspect and soil type.

"It is a simple form of natural selection; every farmer could breed their own modern race," he adds.

To test the adaptability of these populations they were subjected to major environmental changes. In a Hungarian experiment the harsh winter almost killed the whole population off, but replanting the few survivors saw the offspring emerge as a top-yielding line.

Populations can also be moulded by adding new varieties, Dr Döring adds. "Growers can introduce the latest wheat varieties to the population and update it."

TAG's Ron Stobart says the concept could have real value for both organic and conventional growers. "Two dozen farmers in the UK are now growing populations on their farms, and we look forward to seeing how quickly the populations will adapt to the respective farm conditions."

Task 1
Read the text and complete the table with your short notes (based on the text) with no more than 6 words, according to the example (0).

	NOTES
Aim of research	*0. to develop unique local wheat populations*
Advantages of traditional monocultures	1.
	2.
Additional advantages of new populations	3.
	4.
	5.
The three steps of Dr Döring's experiment	6.
	7.
	8.
Evolutionary process similar to the experiments	9.
Result of Hungarian experiment	10.
Method of updating wheat populations	11.

Task 2
Read the text again and use it to decide if the statements are true (T) or false (F). Write your answers in the table below according to the example (0). Please note that if all your answers are marked as true or as false, your answers will be disqualified.

STATEMENTS	**TRUE OR FALSE**
0. The project was co-funded by 3 research groups.	*F*
12. Variety mixtures are less diverse than mixed wheat populations.	
13. Experiments included several combinations of varieties for "all-round" purposes.	
14. Uneven plant height increases their ability to have higher yields.	
15. The experiments in organic and conventional farming produced conclusive evidence about the quick adaptability of populations.	

ENVIRONMENTAL TOPICS

1. China Trying Emission Trading to Curb Acid Rain

China's first agreement on sulfur dioxide emission trading reached by two power plants in different cities becomes effective from October this year.

Both plants, the Taicang Port Huanbao Power Co., Ltd., the buyer, and the Nanjing Xiaguan Power Plant, the seller, are in east China's Jiangsu province.

The buyer is badly in need of extra sulfur dioxide emission quota as it is planning to generate more electricity to meet local demands. The expansion plan, though environmentally friendly, will generate another 2,000 tons of sulfur dioxide a year, which is far beyond the original emission quota the company is permitted.

The seller, however, saves an emission quota of 3,000 tons per year, thanks to the state-of-art technology it has introduced from Finland.

With the Jiangsu Provincial Department of Environmental Protection as the "go-between", the two power plants began negotiations at the end of last year and have finally reached agreement.

According to the agreement, the buyer will pay 1.7 million yuan (about 204,800 US dollars) for an annual emission quota of 1,700 tons from the seller over the next three years.

The two sides agreed to re-negotiate by the year 2006 according to market conditions at that time.

The trade-off would have a slight climatic impact on Taicang City under the worst case scenario, according to an evaluation on the deal's feasibility made by the Nanjing Environmental Protection Institute of the former State Power Corporation.

"The deal is an instructive trial for China's future emission trading operation," said Xue Renjie, chief of the pollution control section of the Provincial Environmental Protection Bureau.

The practice of emission trading did not mean that money would give an unprincipled green light to pollution, said an official in charge of pollution control with the State Environmental Protection Administration (SEPA).

Buyers and sellers were allowed to trade only within the State pollution control limits, and they could not worsen the local environment, said the official.

The agreement was achieved against the backdrop of a pilot emission trading program launched in China last March.

The program, co-organised by the SEPA and the United States Environmental Defence (EDF), was China's first attempt at using economics to curb acid rain.

Sulfur dioxide creates acid rain, which has become a major environmental problem in China, due to the nation's heavy reliance on coal-burning power plants.

SEPA began the experiments in east China’s Shandong and Jiangsu provinces, north China’s Shanxi province, central China’s Henan province, Shanghai and Tianjin municipalities, and Liuhou city in south China’s Guangxi Zhuang Autonomous Region.

"The Taicang case is also a win-win deal," said Dr. Zhang Jianyu, program manager of the China Emission Trading at EDF, which pioneered the successful emissions trading program in 1990 in the United States.

The buyer got the emission quota, a must for its future expansion while the seller was rewarded with a chance to recover its cost of environmental protection, he said.

Emission trading schemes have come about because of caps set on the amount of pollution that can be produced by industrial sources, such as power plants and other factories.

Those released fewer emissions than the permitted level are allowed to store the excess quota for future use or to trade with other industrial units which cannot meet the pollution targets set by the environmental protection authorities.

China plans to invest nearly 100 billion (12 billion US dollars) in preventing and curbing sulfur dioxide and acid rains during the Tenth Five-Year Plan (2001-2005). Regions that

altogether emit two-thirds of China's sulfur dioxide are required to cut the pollution by 20 percent in 2005 from that of the year 2000.

Task 1
Read the text and choose the option that best fits the text, according to the example (0).

0. China's first agreement on sulfur dioxide emission trading….
- *a) comes into effect next October.*
- *b) came into effect last October.*
- *c) comes into effect this October.*
- *d) is a plan for the distant future.*

1. The buyer needs an extra sulfur dioxide quota because…
- a) the government in China forces the power plants to collaborate.
- b) the local energy demand has increased in the province.
- c) it wants to suppress the environmental conflict with the other plant.
- d) in Jiangsu province the sulfur dioxide emission reached the critical threshold.

2. Thanks to the state-of-art technology the quota seller plant…..
- a) can save a carbon dioxide emission quota of 3,000 tons per month.
- b) can save a carbon dioxide emission quota of 3,000 tons per year.
- c) can save a carbon monoxide emission quota of 3,000 tons per year.
- d) can save a sulfur dioxide emission quota of 3,000 tons per year.

3. The possible climatic impact of increased emission
- a) will not effect Taicang city in any case.
- b) on Taicang city was not scientifically investigated.
- c) will effect Taicang city only slightly even in the worst case.
- d) Will effect Taicang city seriously even in the best case.

4. While buying and selling emission quota in China….
- a) both state and local environmental interests have to be taken into consideration.
- b) state pollution control limits have to be taken into consideration.
- c) regulations of SEPA have to be taken into consideration.
- d) the local provincial interests and regulations have to be taken into consideration.

5. According to the Tenth Five-Year Plan….
- a) China wants to invest relatively little in protecting the forests against acid rain.
- b) regions, being responsible for 2/3 of national carbon dioxide emission, have to cut the pollution by 20 %.
- c) all the provinces have to decrease the sulfur dioxide emission by 20 %.
- d) China wants to focus on decreasing sulfur dioxide emission and thus on protecting its forests.

0.	1.	2.	3.	4.	5.
C					

China Trying Emission Trading to Curb Acid Rain (CONTINUATION)

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China plans to invest nearly 100 billion (12 billion US dollars) in preventing and curbing sulfur dioxide and acid rains during the Tenth Five-Year Plan (2001-2005). Regions that altogether emit two-thirds of China's sulfur dioxide are required to cut the pollution by 20 percent in 2005 from that of the year 2000.

Task 2
Read the text again and provide short answers to the questions according to the example (0), in no more than 3 words.

QUESTIONS	ANSWERS
0. What does the increased sulfur dioxide emission cause in nature?	*Acid rain*
6. What is the aim of the agreement taking place in China's Jiangsu province?	
7. How long does the first part of the agreement between the quota buyer and seller extend to?	
8. When is the agreement reviewed?	
9. Which association is responsible for pollution control in China?	
10. What does the extra emission quota allow quota buyers?	

2. One Percent of U.S. Coal Plants Closed to Avoid Pollution

One of the nation's largest coal-burning utilities said yesterday it will shutter 18 of its coal-fired boilers and pay billions to rein in pollutants at many of its remaining units. The move by the Tennessee Valley Authority will result in nearly 1 percent of the nation's coal-fired power capacity going offline by the end of 2018. Environmentalists yesterday hailed the agreement as a success for public health that will result in major reductions of greenhouse gases on top of targeted benefits in reductions of sulfur dioxide (SO_2) and nitrogen oxides (NO_x).

EPA estimated that the agreement will cut TVA's NO_x by 69 percent and SO_2 by 67 percent, resulting in about $27 billion in annual health care benefits by averting thousands of early deaths, asthma attacks and heart attacks.

The federally owned Tennessee Valley Authority will be closing 18 units at three of its plants in Tennessee and Alabama as part of the agreement, affecting about 16 percent of its coal-fired electricity generating system. TVA will also need to invest in pollution control retrofits for most of its remaining 41 coal-fired plants, which the company said could cost between $3billion and $5billion.

Another provision of the agreement requires TVA to inject $350 million into energy projects to slash pollution and save energy, with $240 million of that sum funding energy efficiency initiatives. A $40million chunk of TVA's funds will also go toward reducing greenhouse gases and other pollutants through waste heat recovery, hybrid electric charging stations, solar installations and waste treatment methane gas capture projects.

"Today's announcement locks in the retirements ahead, so now we'll see what the next steps are for reductions in greenhouse gases and what will replace the coal-fired power plants," said Bruce Nilles, deputy conservation director for the Sierra Club, a group involved in the settlement. "Putting an end to burning millions of tons of coal means huge reductions in greenhouse gases," he said.

15 million tons of CO_2 to be eliminated

The 18 units slated for closure emitted about 15 million tons of carbon dioxide in 2008, according to TVA. To replace the electric capacity, TVA will look to "low-emission or zero-emission electricity sources, including renewable energy, natural gas, nuclear power and energy efficiency," the utility said in a statement.

Stephen Smith, executive director of the Southern Alliance for Clean Energy and an unpaid adviser for a group that crafted a long-term strategy for TVA's future resource use, estimates that the closures will shrink TVA's carbon footprint by about 10 percent. He called these coal reductions "very important," since TVA is one of the largest coal plant operators in the country and continues to be a major player in the southeastern United States. Other companies will see this choice and follow suit, since it will be expensive to install environmental controls on some of these older, inefficient plants, he said. With this announcement, he said, "you are seeing a major company in the southeastern United States announcing commitments to retire significant amounts of coal."

"These units are among the first built by TVA and have served us well over the years since the 1950s. But as times change, TVA must adapt to meet future challenges". TVA President and CEO Tom Kilgore told his board yesterday in Chattanooga, Tenn., where the majority of the board signed off on the plan, according to a statement. Installing needed modern pollution control equipment at these facilities would not be cost-effective, he said. "The message here,"

he said, "is that we don't have anything against coal, but we have to reduce the pollution that comes from coal to our air, to our water and on our land."

Task 1

Read the text and choose the option that best fits the text, according to the example (0).

STATEMENTS	**BEST OPTION**
0. The closures were decided by *A. the states of Tennessee and Alabama* *B. the Sierra Club* *C. Tennessee Valley Authority.*	*C*
1. The highest amount of the total sum spent on the overall package was allocated for A. retrofitting pollution control devices B. reducing greenhouse gas emissions C. energy efficiency measures	
2. To make up for the lost capacity, TVA will use A. nuclear energy exclusively B. a mixture of renewable and non-renewable energy sources C. energy saving procedures as well as a combination of other energy sources	
3. According to Tom Kilgore, the closures of the old plants will have to be carried out because A. the company has changed its views about coal B. the environmental update would be too expensive C. they are unable to adopt to pollution reduction requirements.	

Task 2

Read the text again and use it to complete the table with your short notes with no more than 4 words, according to the example (0).

	NOTES
Date of the planned closures	*0. 2018*
benefits of the closures in the field of emissions	4.
	5.
impact on public health	6.
future alternative energy sources	7.
	8.
	9.
the effect of coal reduction on other companies	10.

3. Presence of persistent chemicals in the human body - results of Commissioner Wallström's blood test

0. The presence of persistent chemicals in the human body and their potential harmful effects is amongst the problems addressed by the European Commission's recent proposal for a new regulatory framework for chemicals. To illustrate this problem, Margot Wallström, European Commissioner for Environment, submitted a sample of her blood for testing. The results of these tests, which give a record of the chemicals to which Mrs. Wallström has been exposed and which have accumulated in her body, have been published by the European Commission today.

1. Commissioner Wallström participated in a bio-monitoring survey conducted by World Wildlife Fund (WWF) sending 40 ml of her blood for screening to the Department of Environmental Sciences of Lancaster University in the United Kingdom. The survey covered a sample of 156 people from the UK (England, Scotland, Northern Ireland and Wales) and Belgium. Both women and men were included, with ages ranging from 22 to 80 years. Mrs. Wallström was checked for 77 man-made chemicals, which can be found in everyday products such as TV sets, carpets, furniture and food. The 77 chemicals fall into three groups: PBDEs (Poly Brominated Diphenyl Ethers), PCBs (Poly Chlorinated Biphenyls) and OCPs (OrganoChlorine Pesticides).

2. Chemicals belonging to these groups are in general very persistent (they do not break down and thus remain in the environment for a long time) and bio-accumulative (they build up in the human body and in animals over time). Persistent and bio-accumulative chemicals are also passed on to children during pregnancy and breast-feeding.

These chemicals are often 'hormone disrupting', which means that they interfere with the hormone and reproductive systems of humans and animals that are exposed to them. Developing babies in the womb are particularly at risk. In animals, endocrine disrupters have even been known to cause gender changes.

3. Out of the 77 chemicals analysed, the laboratory in UK found 28 chemicals in Mrs. Wallström's blood. The presence of persistent and bio-accumulating substances in her blood test shows that nobody can escape contamination by chemicals. Despite intense research on some of the chemicals, there is a general lack of knowledge about the effects on human health and the environment of more than 99 % of the total volume of chemicals on the market. It is therefore essential to systematically examine all chemicals used in significant quantities in the EU.

4. REACH, a new regulatory framework for chemicals proposed by the Commission on 29 October 2009, has been devised to tackle this problem. It stands for Registration, Evaluation, Authorisation and Restrictions of Chemicals. Producers and importers of chemicals in volumes greater than 1 ton per year will be obliged to register them in a central database with information on their properties, their uses and risks, and safe ways of handling them. Information will be required in proportion to the volumes in which a substance is produced and the risks it may pose. Substances of very high concern will require use-specific authorisations, and uses causing unmanageable risks will be phased out as the European Commission will continue to be able to issue partial or total bans.

5. Substances of very high concern include PBTs (persistent bio-accumulative and toxic substances), vPvBs (very persistent and very bio-accumulative substances), CMRs (carcinogenic, mutagenic and reproduction-toxic substances) and substances identified as having serious and irreversible effects on humans and the environment equivalent to the other three categories. The latter include endocrine disrupters.

Most of the substances included in the survey are PBTs or vPvBs. If REACH had been in place 30 years ago, it would have identified these substances and would have made sure that they were used only with the appropriate risk management measures, or if the risks were unmanageable, then their use would have been restricted or banned.

6. Under REACH, already existing bans in EU legislation will remain in force. Applications for the Authorisation of substances banned in the EU will thus not be possible. For example,

PCBs and DDT are both banned under the Stockholm Convention, which is expected to be implemented in the EU with a new Regulation in early 2010. No applications for Authorisations of the use of these substances will be accepted.

Task 1

Read the article and match the summaries with the correct paragraphs. Write your answers in the table according to the example (0). There is one extra heading you don't need to use.

SUMMARIES
A. Planned regulations for trading, applying and handling of chemicals
B. Features and harmful effects of chemicals on the human body
C. Proposal of the European Commission about a new regulation of chemicals
D. Future regulations of REACH concerning banned substances in the EU
E. Personal opinion of the European Commissioner for Environment about proposing REACH
F. Details and methods of the international survey
G. Groups of chemicals, being most harmful on the human body
H. Direct and indirect reasons of creating a new regulatory framework for chemicals

0	**1**	**2**	**3**	**4**	**5**	**6**
C						

Task 2

Read the text and provide short answers to the questions according to the example (0).

QUESTIONS	**ANSWERS**
0. What is the position of Mrs. Wallström in the European Commission?	**European Commissioner for Environment**
7. What is the collective name of chemical groups called PBTs, vPvBs and CMRs?	
8. Why can the period of pregnancy and breast-feeding be risky concerning harmful substances?	
9. What kind of substances can confuse even the sex of animals?	
10. How will REACH regulate the authorization of previously banned substances?	

4. Food safety

Public concern over food safety has increased dramatically in the last few years. Internationally accepted food standards are critical to protect public health. Here are the main international efforts to regulate food production and processing.

Codex Alimentarius

Since 1993, an international food code has been in place to ensure food safety worldwide. Codex Alimentarius, jointly administered by FAO and the World Health Organisation, sets standards for pesticides and veterinary drug residues, additives, food imports, inspections and food sampling methods, among other issues. It serves as the basis for many national food standards.

Codex has established such well-known safeguards as the "Best if used before" food label and definitions for low-fat and light food. Evolving constantly, it is now meeting the new challenges of organic farming and biotechnology. For example, a Codex task force is currently drawing up recommendations on labelling standards for genetically modified ingredients.

Codex considers independent scientific advice from such bodies as the Joint FAO/WHO Expert Committee on Food Additives, the Joint FAO/WHO Meeting on Pesticide Residues and the Joint FAO/WHO Consultation on Biotechnology and Food Safety.

The HACCP Approach

The Hazard Analysis Critical Control Point (HACCP) system, which monitors critical steps in the food chain, has had a major impact on reducing contamination during food processing. Introduced in the food industry in the United States in the 1970s, HACCP has been recommended by Codex Alimentarius since the mid 1990s. It is now required by regulators in many countries such as those of the European Community and the United States.

The adoption of HACCP in poultry processing plants in the United States probably contributed to a 26% decline nationwide between 1997 and 1999 in the incidence of illness caused by *Campylobacter*, the most common food-borne bacterial pathogen.

HACCP does not rely on end-of-the-line product inspection, instead, it identifies exactly where problems *might* occur and the food handler takes appropriate precautions to prevent contamination. For example, a plan for mushroom canning lists all the steps needed to produce a safe product. At the step where filled cans are weighed the plan describes the potential hazard as "overfilling resulting in underprocessing" and calls for technicians to remove mushrooms as needed. Finally, a control report filed at each step to ensure continual quality control.

Growing trade highlights food safety

The growing volume of international trade in agricultural products makes the rapid transmission of food hazards more likely – and responses more urgent. Rejected food shipments cause considerable economic hardship and, if sold elsewhere, can harm human health. In 1991 in Peru, a cholera epidemic linked to the fisheries sector led to lost orders for US$700 million in fish and fish products. Every year, African countries lose US$250 million in export earnings because groundnut products fail to meet international guidelines for the contaminant aflatoxin.

The Agreement on the Application of Sanitary and Phytosanitary measures (SPS), negotiated during the Uruguay round of multilateral trade negotiations, entered into force in 1995. SPS requires that Codex Alimentarius food safety standards be applied; if a World Trade Organisation member country requires more stringent standards it must justify them.

The main problem for poorer countries is the cost of meeting the standards. The HACCP approach in particular, with its need for trained and literate operators, can be expensive to implement. FAO has proposed a food safety and quality fund to provide grants to the least developed countries to strengthen their systems.

Under a new Codex-promoted approach called "equivalence", which is recognized by the SPS, countries recognize other nations' inspection systems if they have broadly the same effect. This allows lower-income countries to use labour-intensive systems instead of capital-intensive ones.

New challenges for regulators

Genetically modified (GM) foods can harm consumers if the modification transfers allergens from one organism to another. Regulations should require, therefore, that food labelling specify any GM ingredients that transmit commonly known allergens.

Organic farming is also making steady inroads throughout the world. While it reduces chemical residues, the absence of preservatives results in a theoretically higher risk of microbial contamination. In practice, organic produce can be as safe as conventional foodstuffs. However, as organic farming spreads into regions with varying regimes of food standards, Codex Alimentarius will be needed more than ever to ensure food safety.

Task 1

Read the text again and complete the sentences based on the text using no more than 4 words, according to the example (0).

SUMMARY SENTENCES	COMPLETION
New challenges for food safety regulators are the spread of …… and …… .	*0. organic farming* *00. GM food*
The novelty of HACCP approach is that instead of only inspecting products at the end of food processing, it …….	1.
The developing countries cannot always apply HACCP standards due to the lack of …… .	2.
GM food worries regulators insofar as it can …… .	3.
Though organic production is usually safe, there is still a likelihood of …… .	4.
FAO and WHO jointly operate scientific bodies, who advise …….. on food safety.	5.
Both the Codex and SPS accept the mechanism of …….. regarding food safety in bilateral relations.	6.
Rejected food consignments might cause diseases in the case they are …… .	7.

4.Food safety (CONTINUATION)

Public concern over food safety has increased dramatically in the last few years. Internationally accepted food standards are critical to protect public health. Here are the main international efforts to regulate food production and processing.

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Task 2

Read the text and choose the option that best fits the text, according to the example (0).

The canning of mushroom is an example for

A. how HACCP operates.
B. how Codex Alimentarius operates.
C. how SSS operates.

The SPS system

A. specifies attainable standards for all participants.
B. requires more stringent measures from the developed countries.
C. relaxes the existing regulations for the developing countries.

The SPS agreement is aimed at

A. reducing the amount of aflatoxin in groundnut products.
B. preventing cholera epidemics in the fishing sector and fish products.
C. enforcing Codex guidelines in fighting food-borne diseases.

The standards set by Codex Alimentarius

A. apply only in America and Europe.
B. can be relaxed bilaterally.
C. compulsory internationally.

0.	8.	9.	10.
A.			

5. North Sea scientists fishing for facts

Every December the European Commission makes proposals for fishing quotas in EU waters, based on the advice of international scientists.

This year the scientists have advised that in order to save the endangered cod stocks, there should be a total ban next year on fishing for cod and associated species in waters around Britain. The proposal will be haggled over by ministers at their December council in Brussels. But already fishermen have denounced it as unrealistic.

The dispute between scientists and fishermen over the state of cod stocks has become an annual ritual. Every year the fishermen say the scientists are exaggerating the danger to the stocks, while the scientists say the fishermen are threatening their own long-term livelihoods by ignoring their warnings of an imminent collapse of cod in the North Sea.

So who is right? Two days spent aboard the biggest Danish fisheries research vessel, the Dana, reveal a team of dedicated scientists who feel maligned in the annual battle over quotas. "We feel sorry for the fishing communities," says the team leader, Henrik Degel, of the Danish Institute for Fisheries Research. "But our job is to give unbiased scientific advice. It is for the politicians to take decisions on the social consequences."

The scientists believe they have a broader view of the situation in the sea than the fishermen. "Because they are good at their jobs," says David Griffith of the International Council for the Exploration of the Seas (Ices), "the fishermen go to parts of the sea where there are a lot of fish, so they get the impression of abundance. We have to study the whole sea, including the gaps."

On the Dana, the crew is trying to get representative hauls, which are analysed to determine the age-groups and species caught. The fish are measured, weighed and dissected in a wet lab on board the ship. Crucial to the investigation are six little bony "otoliths" which are taken from the fish's inner ear. The otoliths are the fish's sensory mechanism, which allow it to balance - but for the scientists they represent the best way of establishing the fish's age, for the otolith grows rings, like a tree.

The data collected on the Dana is collated with data from many other research ships around Europe.

Mathematical model

By working out the numbers of fish in each annual age-group, the researchers draw up a mathematical model which enables them to calculate what proportion of the fish stock disappears each year, either by natural causes or by being caught in fishermen's nets. They then apply the model to the catches in Europe, and work out how many fish from each species are left alive.

The graphs they produce to show the decline in cod stocks are alarming. This year's Ices reported that in the North Sea and Skaggerak there are only 52,000 tons of cod - one-third of the minimum stock size which they believe is necessary to ensure the species' survival. In the waters west of Scotland they say there are only 2,500 tons of cod left - compared to the 22,000 tons they say are needed.

Based on these figures, they advise that no more cod should be caught until the stock recovers. That could happen at any time, because certain years - inexplicably - produce large numbers of juvenile fish. But, in any case, they say: only a moratorium will give the fish a chance.

The scientists believe their estimates are correct to within about 10-15%. But while they are dedicated to producing objective data, the decisions on how much fish will be caught are ultimately political.

At the December fisheries council ministers try to strike a balance between the European Commission - whose proposals invariably follow the scientific advice - and the fishermen, trying to save their communities.

Ways forward

This year, Scottish fishermen have come up with two ideas which they hope will help to improve the situation.

One is to persuade the commission that they can trawl for haddock - the staple Scottish catch - without taking out too much cod as a by-catch. (The scientists argue that the two species swim largely together.)

The other is an invitation to the scientists to put far more observers on board the fishing vessels.

Mike Park, of the Scottish White Fish Producers Association, says scientists treat the landings reported by fishermen with scepticism, so having them aboard "on a continuous basis" would increase trust. "We would get a real picture," he says.

In the meantime, at December's fisheries council hammering out next year's quotas is likely to be as difficult as ever.

Task 1

Read the text and use it to decide if the statements are true (T) or false (F). Write your answers in the table below according to the example (0). Please note that if all your answers are marked as true or as false, your answers will be disqualified.

STATEMENTS	TRUE OR FALSE
0. A moratorium on fishing cod is on the table for discussion in December's fisheries council.	**T**
1. *Ices* is unbiased towards any extreme views in the fishing debate.	
2. The European Commission will inevitably find compromises between scientists' advice and fishermen's claims.	
3. A group of fishermen have put forward new suggestions to make observations on fish stocks more accurate.	

Task 2

Read the text again and complete the sentences based on the text using no more than 3 words, according to the example (0).

SUMMARY SENTENCES	COMPLETION
(0). Scientists and fishermen have a conflict of …. ….	***interest***
4. Fishermen claim the danger of depleting fish stocks is …….. .	
5-6. The mathematical model estimates the proportion of …….. fish per year and the number of ……fish in the species.	
7. The fish's age is established by ……. its otoliths.	
8. The exact time of fish stock recovery ……	
9. A new proposal would put the emphasis on fishing less cod and more ……. .	
10. According to fishermen, observers on board of the fishing vessels would confirm …….. .	

6. Waste water harnessed to make electricity and plastics

TREATING waste water is energy intensive. But soon it might be able to earn its keep.

A team led by Hong Liu from Oregon State University in Corvallis has plans for microbial fuel cells that will reclaim energy from waste water and produce around 2.87 watts per litre of waste water. That is almost double the amount of electrical power usual for such a cell. And its by-products could be harnessed to create cheap, biodegradable plastics.

Waste water holds huge amounts of energy, bound up in organic molecules, but it can be difficult to access. The Oregon fuel cells run on microbes that would normally digest organic matter to produce water. In a fuel cell, though, isolated from oxygen, that conversion stalls and electrons, which are bundled with protons and oxygen to form water, are pulled away from the microbes by the potential between a cathode and an anode, creating an electrical current.

As well as tweaking the mixture of microbes on the electrodes, the Oregon design has also managed to squash far more electrodes into the fuel cell than on previous versions. Liu says her lab aims to scale up the device within the next five years and make it cheaper.
The by-products of waste water treatment can be harnessed too. Engineers are working on a way to convert methane into biodegradable plastics.

The dream plastic would be biodegradable, made from organic materials, and break down easily. At the moment, polyhydroxyalkanoate (PHA) seems the best option. But PHA plastics are manufactured by genetically modified bacteria fed on sugars in a process that is both expensive and complex, making it hard for them to compete with conventional plastics. In the past, researchers have used the by-products of waste water treatment to generate fuel and sometimes even to create plastics, but nearly all these attempts have focused on the "sludge" of sediment, solid waste and chemicals. Because the sludge is made of many diverse components, it produces a less stable plastic.

So Molly Morse of Mango Materials in California and colleagues are now using methane, another major by-product of treating waste water. Methanotrophs, simple organisms that feed on methane, are much better at converting it into polymers than typical bacteria are at converting sugar into plastics. Methane is pumped into a vat of methanotrophs - harvested from the waste water treatment plant itself - along with a bubbling stream of oxygen and a few other nutrients. The end result is a polymer powder that can be separated from the mass of bacteria and turned into pellets for shaping into commercial plastic products.

Morse envisions that their waste water plastic could be used for all kinds of temporary or disposable applications, ranging from packaging materials to beauty products.

Craig Criddle at Stanford University in California, who is on the firm's advisory board, says when methane itself is sold as fuel it first needs to be cleaned up. Then it will bank about 60 to 80 cents for 3 to 4 kilograms, whereas the same amount of methane could yield a kilogram of plastic, bringing in 4 to 5 dollars. "There's huge value added in going from biogas to plastic," he says.

Task 1

Read the text and use it to complete the table with your short notes with no more than 5 words, according to the example (0).

	NOTES
amount of energy gained per litre of waste water	*0. 2.87 watts*
means of gaining energy from waste water	
by-product of waste water reclaiming	
use for the by-product of waste water reclaiming	
improvement on the previous fuel cell design	
disadvantages of PHA plastics production	

Task 2

Read the text again and use it to decide if the statements are true (T) or false (F). Write your answers in the table below according to the example (0). Please note that if all your answers are marked as true or as false, your answers will be disqualified.

STATEMENTS	**TRUE OR FALSE**
0. It needs a lot of energy to clean waste water.	*T*
7. Treating waste water with microbial fuel cells is cost-effective because the process has multiple benefits.	
8. In previous water cleaning attempts stable plastics could not be manufactured from the sludge.	
9. In the Californian experiment the remaining mass of bacteria is pressed into pellets used in plastic production	
10. The most profitable form of selling methane is as a fuel after it has been cleaned up.	

7. Ecologists warn the planet is running short of water

A swelling global population, changing diets and mankind's expanding “water footprint” could be bringing an end to the era of cheap water.

The warnings, in an annual report by the Pacific Institute in California, come as ecologists have begun adopting the term “peak ecological water” — the point where, like the concept of “peak oil”, the world has to confront a natural limit on something once considered virtually infinite.

The world is in danger of running out of “sustainably managed water”, according to Peter Gleick, the president of the Pacific Institute and a leading authority on global freshwater resources.

Humans — via agriculture, industry and other demands - use about half of the world's renewable and accessible fresh water. But even at those levels, billions of people live without the most basic water services, Dr Gleick said.

A key element to tackling the crisis, say experts, is to increase the public understanding of the individual water content of everyday items. A glass of orange juice, for example, needs 850 litres of fresh water to produce, according to the Pacific Institute and the Water Footprint Network, while the manufacture of a kilogram of microchips — requiring constant cleaning to remove chemicals — needs about 16,000 litres. A hamburger comes in at 2,400 litres of fresh water, depending on the origin and type of meat used. The water will be returned in various forms to the system, although not necessarily in a location or at a quality that can be effectively reused.

There are concerns that water will increasingly be the cause of violence and even war. Dan Smith, the Secretary-General of the British-based peace-building organisation International Alert, said: “Water is a basic condition for life. Its availability and quality is fundamental for all societies, especially in relation to agriculture and health. There are places — West Africa today, the Ganges-Brahmaputra river system in Nepal, Bangladesh and India, and Peru within ten years — where major changes in the rivers generate a significant risk of violent conflict. Good water management is part of peace-building.”

David Zhang, a geographer at the University of Hong Kong, produced a study published in the US National Academy of Sciences journal that analysed 8,000 wars over 500 years and concluded that water shortage had played a far greater role as a catalyst than previously supposed.

“We are on alert, because this gives us the indication that resource shortage is the main cause of war,” he told *The Times.* “Human beings will definitely have conflicts over this.”

Although in theory renewable sources of water were returned to the ecosystem and their use could continue indefinitely, Dr Gleick said, changes in the way water was exploited and how its quality degraded meant that methods of processing it would become more expensive.

A significant part of the problem is the huge, and often deeply inefficient, use of water by industry and agriculture. UN calculations suggest that more than one third of the world's population is suffering from water shortages: by 2020 water use is expected to increase by 40 per cent from current levels.

The World's Water report sounds a particularly strong note of alarm over the state of water usage and pollution in China, where unconstrained and inadequately regulated economic expansion has overtaxed freshwater resources and could even begin to threaten stability, and serious social problems can arise.

Task 1

Read the text again and complete the sentences based on the text using no more than 4 words, according to the example (0).

SUMMARY SENTENCES	COMPLETION
Similarly to carbon footprint, the concept of …… has been formed by ecologists with regard to water use.	*0. water footprint*
The limit which should not be exceeded is called …….. .	1.
The lack of access to water might lead to ……. between groups of people.	2.
A glass of orange juice takes …….. water to produce than a hamburger.	3.
In Asia, one of the rivers carrying a risk of future conflicts is the …….. . These could be prevented by ……..	4.
	5.
China is leading the list of wasteful countries with respect to water due to its …… .	6.

Task 2

Read the text and use it to decide if the statements are true (T) or false (F). Write your answers in the table below according to the example (0). Please note that if all your answers are marked as true or as false, your answers will be disqualified.

STATEMENTS	TRUE OR FALSE
0. Water resources are still considered infinite.	*F*
7. Billions of people do not have access to fresh water.	
8. In the history of mankind, water shortage as a factor in the cause of wars is significant.	
9. If used water was returned to circulation immediately after use, all water-related problems could be solved.	
10. By 2020, 40% of the current level of water shortages will be remedied.	

8. Arctic ice thickness 'plummets'

The thickness of Arctic sea ice "plummeted" last winter, thinning by as much as 49 centimetres (1.6ft) in some regions, satellite data has revealed.

A study by UK researchers showed that the ice thickness had been fairly constant for the previous five winters. The team from University College London added that the results provided the first definitive proof that the overall volume of Arctic ice was decreasing.
The findings have been published in the journal Geophysical Research Letters.
"The ice thickness was fairly constant for the five winters before this, but it plummeted in the winter after the 2007 minimum," lead author Katharine Giles told BBC News.
Sea ice in the Arctic shrank to its smallest size on record in September 2007, when it extended across an area of just 4.13 million sq km (1.59 million sq miles), beating the previous record low of 5.32 million sq km, measured in 2005.
The team from the university's Centre for Polar Observation and Modelling - part of the UK's National Centre for Earth Observation - found that last winter the ice had thinned by an average of 26cm (0.9ft) below the 2002-2008 winter average.
Dr Giles added that the data also showed the western Arctic experienced the greatest impact, where the ice thinned by up to 49cm (1.6ft).
The recent record losses of ice cover in the Arctic has led to suggestions that the region could have reached a "tipping point" but some uncertainty over the causes had remained, explained co-author Seymour Laxon.
"The extent can change because the ice can be redistributed, increasing the amount of open water," he told BBC News. "But this does not reduce the overall amount of ice. To determine whether the reduction in sea ice extent is the result of ice being piled up against the coast or whether it is the result of melting, you need to measure the thickness."
"I think this is the first time that we can definitively say that the bulk overall volume of ice has decreased," observed Dr Laxon. "So this means melting; it doesn't mean that the ice has just been pushed up against the coastline."
Dr Giles explained that the measurements gathered by satellite provided a continuous data-set and had a number of advantages over other methods. "Drilling, submarines or aircraft; all of these techniques can be limited by time and space," she said. You can only sample relatively small areas, and you cannot have a continuous time series - it's a very harsh environment, so field experiments in winter are logistically difficult. We have been using satellite data, which means we get coverage all across the Arctic Ocean (apart from the very centre) and we get it continuously, so we have great coverage both in terms of time and area."
The measurements were recorded via a radar altimeter onboard the European Space Agency's (Esa) Envisat satellite.
The altimeter fires pulses of electromagnetic waves down on to the ice, which reflects them back up to a receiver on the satellite. The time taken for the waves to complete this journey is recorded, and it is a fairly straightforward calculation to work out the height of the ice above sea level. As one tenth of the ice sits above the water, it is then possible to work out the overall volume and thickness of ice in that location.
Dr Laxon said the project's findings are being used to help climate modellers refine their projections of what is going to happen in the future. "The time when Arctic sea ice is going to disappear is open to a lot of debate," he said. "About five years ago, the average projection for the sea ice disappearing was about 2080. But the ice minimums, and this evidence of melting, suggests that we should favour the models that suggest the sea ice will disappear by 2030-2040, but there is still a lot of uncertainty."
The researchers hope to keep the data series, funded by the EU and the Natural Environmental Research Council (Nerc), running for as long as satellite-based measurements are available.

Task 1
Read the text and use it to complete the summary by no more than 6 words, according to the example (0).

SUMMARY
The ***(0)…. research……*** on Arctic ice coverage has got a new momentum by using (1)……..…… equipment from satellites. It is more effective than previous technologies, since it can provide (2)……... and (3)…….…….. data from the Arctic, without (4)……... problems in the wintertime. The data gained shows an (5)……. rate of ice shrinkage, which can be caused either by (6)…….. or by (7)…… .

Task 2
Read the text and choose the option that best fits the text, according to the example (0).

STATEMENTS	**BEST OPTION**
0. The project was co-funded by **A.** UCL and Geophysical Research Letters **B.** EU and Nerc **C.** ESA and the UK	B
8. The project aims at finding out about the ice's A. temperature and size B. thickness and depth C. extension and thickness	
9. Projections about the disappearance of the ice A. are still much debated B. are easily available C. are impossible to give	
10. To establish facts considering Arctic ice coverage, the radar altimeter uses A. straightforward measurements B. data and calculations C. data and estimations	

9. Winds of change

Proposals for a new generation of wind farms are popular with the British public, but they may not be enough to offset the looming energy crisis, writes Alok Jha

It should come as no surprise that politicians are interested in excessive hot air. But today's announcement that the government plans to harness the wind blowing around the UK's coasts to provide up to a tenth of our energy needs has delighted environmentalists everywhere. But will it actually make much of a huge difference?

The department of trade has released proposals for the next generation of offshore wind farms, forecast to provide up to six gigawatts of energy by the end of the decade, enough to power 15% of all British homes.

On the same day, the industry's professional body, the British Wind Energy Association (BWEA), has revealed the British public are fully on board. "The survey revealed the continuing high level of support for wind energy, with a massive 74% of bill payers polled in favour of increasing the use of wind power in the UK," says the BWEA.

"Today's announcement from government to expand offshore wind therefore comes with the support of three-quarters of Britain's tax payers."

The way a wind farm makes electricity is simple. "A wind turbine converts a flow of air into a torque which produces electricity," says David Kerr, a member of the energy board at the Institute of Civil Engineers.

The circle extracts the energy from the entire circle that the blades describe. The turbine is at the top of the windmill tower in what is called the nacelle. The electricity is then cabled down to a local substation before being added to the national grid.

There are already 11 offshore wind farms around the world - mainly in Denmark and Sweden, in the Baltic sea - with a total of 163 turbines generating 260 megawatts of power.

The government has identified three sites around the UK which could house our wind farms - the Thames Estuary, the Greater Wash and off the coast of the north west of England. The average wind speeds over water are significantly higher than they are over land, so they are an ideal place for the wind farms.

"What has tended to be of concern is potential effect on birds," says Mr Kerr. "There's been a lot of debate on to what extent the birds learn to avoid the wind turbines or get killed by them." A single bird would probably be able to react quickly enough to avoid the blades but a flock of them might not be so lucky.

The windmills can also interfere with radar so the armed forces are also more than a little concerned. Since the latest proposals also recommend wind farms more than 10 miles beyond the UK coast, they also need to be clear of shipping lanes.

Plugging the wind farms into the national grid could pose some problems as well with fears that the cost could negate any benefits in the long term. "A lot of work is going on at the moment regarding 'rewiring' Britain for the new energy era, but we don't have all the answers yet," says the BWEA.

Even with today's increases, wind power is not the solution to our energy problems because, put simply, the wind does not blow all the time. Most wind farms on land generate for around a third of the time. Offshore, experts say that the figure is likely to be more like 40%.

"You can't rely solely on intermittent power sources," says Mr Kerr, who was part of the team that published a report last week on Britain's looming energy crisis. This is particularly true, he says, when you consider the unpredictability of British weather. "If you get a high pressure in winter, you can have a period of two weeks when the temperatures are all below zero and there is no wind."

His conclusion is that we need a combination of gas and clean burning coal with the possibility of further nuclear power stations.

Task 1

Read the text and use it to decide if the statements are true (T) or false (F). Write your answers in the table below according to the example (0). Please note that if all your answers are marked as true or as false, your answers will be disqualified.

STATEMENTS	TRUE OR FALSE
0. Environmentalists totally agree that more wind farms are good news.	**F**
1. Currently there is an energy crisis in Britain.	
2. The experts have not quite worked out the technical details of how to change Britain's energy system.	
3. The wind turbine needs an intermediate stage before the energy is connected to the national grid.	

Task 2

Read the text again and use it to complete the table with your short notes with no more than 7 words, according to the example (0).

	NOTES
Rate of the British public supporting the new windfarms	**0. 74% of taxpayers**
Position of the turbines	4.
Reason of placing windfarms offshore	5.
Problems to solve	6.
	7.
	8.
	9.
	10.

10. Energy Performance Certificate

Energy Performance Certificates (**EPCs**) were introduced in England and Wales on 1 August 2007 as part of Home Information Packs (HIPs) for domestic properties with four or more bedrooms. When the requirement for HIPs was removed in May 2010, the requirement for EPCs continued. The scheme for HIPs was extended to encompass three bedroom homes from 10 September 2007. The EU Directive 2002/91/EC relating to the energy performance of buildings was transposed into British law by the Housing Act 2004 and The Energy Performance of Buildings (Certificates and Inspections) (England and Wales) Regulations 2007. However, EPCs have been criticized by many professional bodies for their inaccuracy, and low reliability for old and listed buildings.

Procedure

The energy survey needed to produce an EPC is performed by an assessor who visits the property, examines key items such as loft insulation, domestic boiler, hot water tank, radiators, windows for double glazing, and so on. He or she then inputs the observations into a software program which actually performs the calculation of energy efficiency. The program gives a single number for the rating of energy efficiency, and a recommended value of the potential for improvement. There are similar figures for environmental impact. A table of estimated energy bills per annum (and the potential for improvement) is also presented, but without any reference to householder bills. The householder will have to pay for the survey, which costs around £100 for a four bedroom house. The exercise is entirely non-invasive, so assessors have to take certain amount of information on trust from householders, such as whether or not cavity wall insulation is present unless there is evidence such as drill holes present.

Property Details

The certificate contains the following property details: property address, property type (for example detached house), date of inspection, certificate date and serial number and the total floor area. The total floor area is defined as the area contained within the external walls of the property. The figure includes internal walls, stairwells and the like, but excludes garages, porches, areas less than 1.5 m high, balconies and any similar area that is not an internal part of the dwelling.

The A to G Scale

Energy Performance Certificates present the energy efficiency of dwellings on a scale of A to G. The most efficient homes – which should have the lowest fuel bills – are in band A. The certificate uses the same scale to define the impact a home has on the environment. Better-rated homes should have less impact through carbon dioxide (CO_2) emissions. The average property in the UK is in band D or E for both ratings.

EPC Recommendations

The certificate includes recommendations on ways to improve the home's energy efficiency to save money. The accuracy of the recommendations will depend on the inspection standards applied by the inspector, which may be variable. Inspectors, who may be Home Inspectors (HIs) or Domestic Energy Assessors (DEAs), are audited by their accreditation bodies in order to maintain standards. The EU directive requires the EPC recommendations to be cost effective in improving the energy efficiency of the home, but in addition to presenting the most cost effective options, more expensive options which are less cost effective are also presented. To distinguish them from the more cost effective measures, these are shown in a section described as 'further measures'. Because the EPC is designed to be produced at change of occupancy, it must be relevant to any occupier and it therefore must make no allowance for the particular preferences of the current occupier.

Task 1
Read the text and choose the option that best fits the text, according to the example (0).

0. EPCs are regulated by
a) THE EU directive 2002/91/EC.
b) Housing Act 2004 and the Energy Performance of Buildings regulations 2007.
c) both sets of regulations.

1. The EPC is prepared by
   a) an assessor, after visiting the property.
   b) an assessor, who has gathered information from the owner via internet.
   c) the householder, based on voluntary information.

2. The average UK property
   a) is on the bottom of the scale
   b) is toward the lower end of the scale
   c) is nearer the top end of the scale

3. The recommendations in the certificate
   a) may vary from inspector to inspector in the level of detail
   b) must list all the methods of efficiency measures
   c) may be influenced by the preference of the owner

0.	1.	2.	3.
c			

Task 2
Read the text again and provide short answers to the questions according to the example (0), in no more than 6 words.

QUESTIONS	**ANSWERS**
What were EPCs part of up until 2010?	*0. Home Information Packs*
What kind of houses do EPCs not give accurate descriptions for?	4.
What type of systems does the assessor check? (Give 1 example!)	5.
What information is not checked but still included in the certificate?	6.
Apart from administrative documentation, what significant property data is included in EPCs?	7.
How is energy efficiency and environmental impact expressed in ECPs?	8.
Who is entitled to check the homes to issue EPCs?	9.
	10.

Íráskészség a Zöld Út szaknyelvi vizsgán

A felsőfokon az íráskészséget két feladattal mérjük: táblázat/ grafikonleírással, és levél/jelentés írásával.

1. Táblázatleírás/ grafikon leírása

A feladat során egy táblázat vagy grafikon adatait kell önállóan leírni, összehasonlítani, a tendenciákat elemezni és következtetést levonni, 150-200 szó terjedelemben. A szaknyelvi nyelvhasználat során erre a mikro-készségre nagy szükség lehet, írásban és szóban egyaránt.

Az értékelés szempontjai:

Tartalom (0-3 pont)
Szókincs: (0-3 pont)
Nyelvhelyesség (0-3 pont)
Feladatmegoldás: 0-1 pont

Mintafeladat táblázat leírásához:

Study the tables, and describe them in 150-200 words, according to the example (0). The description should include tendencies and comparisons.The description should end with a conclusion or prediction.

Value of Agriculture Sales, 2007 and 2012

	2007 ($ billions)	2012 ($ billions)	% change
All products	297.2	394.6	32.8*
Crops	143.7	212.4	47.8*
Livestock	153.6	182.2	18.7*

**Statistically significant change.*

Source: USDA NASS, 2012 Census of Agriculture.

Agricultural Production Expenses, 2007 and 2012

	2007 ($ billions)	2012 ($ billions)	% change
Total	**241.1**	**328.9**	**36.4***
Feed	49.1	75.7	54.2*
Livestock and poultry purchases	38.0	41.6	9.4
Fertilizer	18.1	28.5	57.6*
Hired labor	21.9	27.0	23.4*
Cash rent	13.3	21.0	58.2*
Seeds	11.7	19.5	66.0*
Supplies and repairs	15.9	18.9	18.7*
Gasoline, fuels, and oils	12.9	16.6	28.4*
Chemicals	10.1	16.5	63.4*
Other	50.1	63.7	27.1*

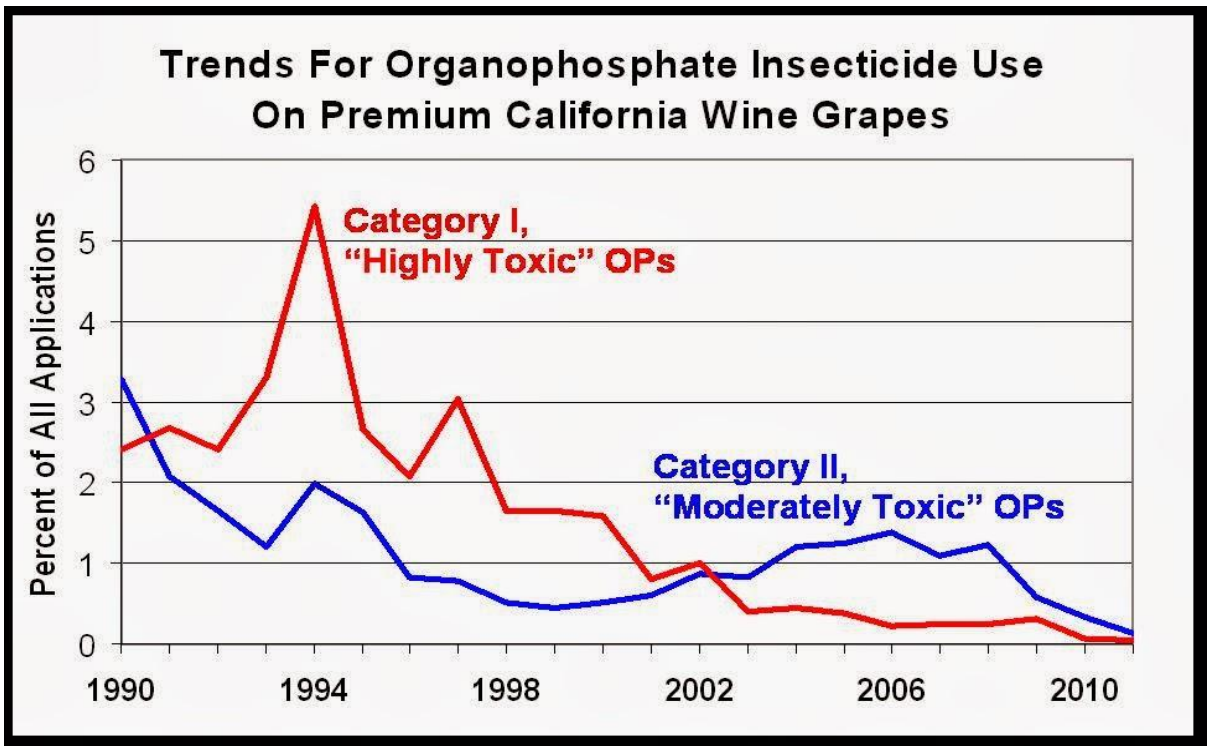
Source: USDA NASS, 2012 Census of Agriculture. **Statistically significant change.*

Example: We can see two related tables from the United States.

The first one shows the values of agricultural sales in 2007 and 2012, while the second table shows the agricultural production expenses in the same two years. The data is taken from the 2012 Census of agriculture.
The sums in both tables are given in billion dollars, while the change from 2007 to 2012 is given in percentages. The results are statistically significant, so they show real trends.
As we compare the two tables, the main tendency we can establish is that costs grew 3.6% more than the value of agricultural sales in the examined five years. This means that agricultural production growth became less dynamic, compared to the rate of growth of the expenses.
If we focus on the sales, we can realise that within the rising overall sales figures, crop production represents a bigger segment (47.8%), while the figures in the livestock sector reflect a slightly lower rate of growth (18.7%).
By contrast, the rise of the production cost affected both plant production and animal breeding. The highest growth occurred in the price of seeds, (66%) and those of the chemicals, (63.4%). However, the feed prices also climbed considerably, by 54.2%.
We can conclude that the plant production sector was more able to increase its productivity than the animal breeding sector.

Mintafeladat grafikon leírásához:

Study the graph, and describe it in 150-200 words, according to the example (0). The description should include tendencies and comparisons.The description should end with a conclusion or prediction.



Example: This is a graph which depicts trends for organophosphate insecticide use on premium California wine grapes.

The graph shows data from 1990 to 2010. The time dimension is show on the horizontal axis, while the percent of organophosphate applications compared to all pesticide use is on the horizontal axis. In the starting year, moderately toxic OPs were used in higher percentage of the applications than the highly toxic ones (3.5 versus 4 percent). But in the following year the tendency was reversed, and till 2002 the more toxic version was used more often. The

peak use of Category I OPS took place in 1994, where nearly 5.5 percent of all the pesticide applications were from among this type.
The turning point occurred in 2002, where category II OP applications overtook category I. The use of category II applications rose slightly till 2008, from where it sank steeply and by 2010 it virtually disappeared.

Applications of the more toxic version were decreasing continuously from 2002 to 2010 when they were probably banned.
The disappearance of this pesticide must have happened due to a rising awareness of healthy way of life and the protest of environment protection organisations. Probably, less harmful alternatives were introduced instead of OP insecticides.

2. Levél vagy jelentés írása

Az íráskészség mérése ebben a feladatban célzottan, autentikusan, direkt módon történik, azaz olyan formában, ahogy arra az életben is szüksége lenne egy angol közegben élő és dolgozó embernek, tehát egy megszabott **műfajú írásmű létrehozásával** (pályázati- és motivációs levél, rövid üzleti jelentés, vagy olvasói levél megírásával). A megadott szituációban, megadott célközönség részére megfelelő stílusban és műfaji formába öntve, folyékonyan és gazdag szókinccsel kell megadott tartalmú angol nyelvű szöveget létrehozni a nyelvhelyességi normák betartásával.

A feladatmegadásban szerepel a kívánt műfaj, a levél/jelentés címzettje, feladója, célja és a kívánt tartalom, 3 irányítási szemponttal. Az írásmű hossza standard: felsőfokon 180-200 szó lehet. A hossz kismértékben túlléphető, és a címzés, megszólítás és elbúcsúzás nem számít bele.

A. **Pályázati/ motivációs levél minta**: (ha a feladat megadásban címzés is szerepel, akkor a klasszikus levél formátumot kell használni.)

MOTIVATION FOR APPLYING FOR A SCHOLARSHIP

NAME : Brama Kumbara

COUNTRY : Madangkara

PROGRAMME : Master of Science in Advance Mathematics, Harvard University

REASONS FOR A (Name of programe) SCHOLARSHIP

First I would like to express my appreciation for this opportunity to apply for XXX scholarship. I am a graduate of Mojopahit University holding a degree in Mathematics Science, First Class Honours.

With the background knowledge I have in mathematics, I strongly feel that a master course in Advance Mathematics will be very relevant to my practice back here in my country Madangkara.

Owing to limited resources, I have not been able to proceed with further studies here in Madangkara as I lack the necessary funds. I would be grateful to be provided with sponsorship to further my education and build a career especially in the public sector such as

local universities and research organisations, where I can transfer the knowledge gained in my country.

In addition I will get a chance through XXX scholarship to interact with students from diverse professional and cultural backgrounds drawn from all over the world.

Once again I am grateful for considering my application and I look forward to a favourable reply.

B. Olvasóilevél-minta:

(Nincs címzés, csak megszólítás és aláírás, a hely megnevezésével. A cél: a meggyőzés.)

Cleaner fuel helps farmers and Oregon

Thanks for your recent enlightening article on the cancer risks. Surprisingly, the solutions posed by the Department of Environmental Quality and described in the article miss a ready solution that could do lots for Oregon farmers and our state's economy while virtually eliminating the health and environmental problems.

Collectively, we now send around $4 billion a year out of the state, much of it to the volatile Middle East, for fossil fuels. Locally produced BioDiesel could substantially reduce this economic and health disaster, replacing it with a clean-burning fuel that protects engines with its higher lubricity, completely avoids the need for adding destructive sulfur, has no net global warming impact and is made from both recycled fryer oil and oil seeds already grown in Eastern Oregon as a rotation crop for wheat.

My wife and I have been driving both of our cars on 100 percent BioDiesel for almost a year and find it almost effortless and surprisingly economical. Multnomah County has been successfully using easily available 20 percent BioDiesel in its trucks and heavy vehicles for about two years.

Given the health impacts and the easy availability of an alternative that would help our farmers and state economy, is it not time for TriMet and responsible drivers of efficient diesel vehicles to do the same?

R. Peter Wilcox
Northeast Portland

C. Short report

SEE EXAMPLE OF A SHORT REPORT

TO: All KFUPM Students
FROM: Ahmed K., Director of Student Transportation
DATE: November 20, 2016
SUBJECT: Report on Survey of Bus Proposal; Recommendations

Attachment: sample of survey (4 pages)
cc: All Deans
page 1 of 2

SUMMARY

The students of KFUPM have a severe parking problem, which has developed recently along with the increased numbers of students being admitted and having cars. Our department proposed having an excellent bus system to solve the problem, but we wanted to hear what students thought. We conducted the following survey, and the results are given below, along with our recommendations.

BACKGROUND
A few years ago, parking for cars was no problem at KFUPM. Recently, though, (about the last two years) this has become a serious problem with lateness accidents, damage and frustration resulting. Our department decided to implement a bus system for students and conducted a survey of all the levels of students from orientation to graduate, to determine their feelings and the best way to serve the students' needs. The survey took one year, and the results are in the next section.

SURVEY RESULTS
The attached survey questionnaire give the details of the actual questions the students were asked. For all questions, either a response of excellent, neutral, or poor with numbers 1 to 7 were asked for. The questions ranged from (*and then continue with the remainder of the explanation in detail).*

……

RECOMMENDATIONS
As a result of this study, here are the recommendations:

1) Do XXXXXX
2) Do YYYYYY
3) Do ZZZZZZZ

Thank you. If you have any questions, please contact me at _____

Értékelési szempontok, elvárások

A levél/jelentés írás feladatot a következő szempontok alapján értékelik:

Kommunikációs érték (tartalom és feladatmegoldás:)	3 pont
Szerkezet és kohézió:	3 pont
Szókincs:	3 pont
Stílus:	3 pont
Nyelvhelyesség:	3 pont

A kommunikációs értéknél a kommunikáció minőségét, a kommunikációs szándék megvalósítását mérik, és terjedelmi szempontokat is, vagyis, hogy megfelelően kifejtették-e az irányítási szempontokat.

A szerkezet és kohézió keretében egyrészt a megírandó írásmű műfaji sajátságainak meglétét mérlegelik, másrészt, hogy milyen logikus tagolással, megfelelő bekezdésekkel készült az írásmű, és hogy milyen összefüggő a szöveg, mennyire jól használja a vizsgázó a kohéziós eszközöket.

A szókincsben három terület meglétét ellenőrzik: a szaknyelvi, a köznyelvi és az általános szaknyelvi lexika szókincs terjedelmét és megfelelő használatát, azaz, hogy funkcionálisan megfelelően és kellően választékosan használja-e a vizsgázó a szókincset.

A stílus szempont alatt annak ellenőrzése történik, hogy megfelel-e a hivatalos írásbeli stílusnak a nyelvhasználat (udvarias, elegáns) a megadott szereppel összhangban.

A nyelvhelyesség szempontban az alapján kapnak pontszámot a vizsgázók, hogy milyen széles körűen és mennyire helyesen használják a felsőfokon elvárt nyelvi szerkezeteket,

különösen abból a szempontból, hogy mennyire segítik a megértést, tehát funkcionális jelleggel.

A kohézió fejlesztésének módjai

A kötőelemeket példamondatokban vagy rövid szövegekben célszerű megtanulni, hogy ne csak a jelentését, hanem a mondatban vagy a szövegben elfoglalt tipikus helyét is ismerje a vizsgázó. A kötőelemek ugyanis vagy mondaton belül fordulnak elő, mondatrészeket vagy tagmondatokat kapcsolva össze, vagy pedig egész mondatok közötti viszonyt jelölnek, és ennek megfelelően máshol állnak a mondatban, és máshogy kell az írásjeleket előttük vagy utánuk használni. Mindkét fő eset szerepelhet feladatainkban.
Alkothatunk saját példamondatokat is, hogy a személyes tartalommal még jobban bevéső djön az ilyen eszközök használata.

A kohéziós eszközök összefoglalása, példákkal

A kohéziós eszközök közül a lexikai kohéziós eszközöket (pl. rokon értelmű szavak használata) nem teszteli a vizsga, mert az túl szerteágazó lenne, hanem csak a grammatikai eszközöket.

Ezek a következők:

TULAJDONKÉPPENI KÖTŐELEMEK (SZAVAK, KIFEJEZÉSEK) - MIND /FŐLEG MELLÉRENDELŐ/ MONDATON BELÜLI, MIND MONDATOK KÖZÖTTI LOGIKAI VISZONYRA UTALHATNAK:

Teljes lista nem állítható fel, de az alábbiakban felsoroljuk a logikai viszonyok főbb típusait, és példát hozunk rájuk, a mondatok fordításával együtt.

Felsorolás

- and
- First, …. (Firstly, …..)
- Second, …. (Secondly, ……..) Another…… Then ….. Next, …
- Finally, ……

Példák:
*Nuclear power offers diversity in the fuels used in the generation of electricity**, and** provides security against shortage of supply of other sources of fuels.*
Az atomenergia változatosságot kínál az elektromosság előállításához felhasznált fűtőanyagok terén, és **biztonságot jelent arra az esetre, ha az egyéb fűtőanyagok ellátásában hiány keletkezne.**

***First**, the Parliament has to pass the bill, **then** the local authorities will implement the law.*
Először a parlamentnek el kell fogadnia a törvénytervezetet, **és aztán** / **majd** a helyi hatóságok végrehajtják a törvényt.

*The **first** stage is to pass the bill. The **next** step is to implement it. (or: **First,** the bill has to be passed. **Next,** it has to be implemented.)*
Az **első** szakasz a törvénytervezet elfogadása. A **következő** lépés a végrehajtás. (vagy: **először** a törvénytervezetet el kell fogadni, **aztán** végre kell hajtani.

The issue of industrial waste management is of great importance. ***Another*** *important question is the selective collection of domestic waste.* ***Finally****, we mustn't ignore the need of educating environmentally conscious young people, from a very early age.*
Az ipari hulladékgazdálkodás nagy jelentőségű kérdés. **Egy másik (egy további)** fontos kérdés a háztartási hulladék szelektív gyűjtése. **Végül** nem hanyagolhatjuk el azt sem, hogy milyen nagy szükség van a környezetbarát szemléletű (környezetvédő) fiatalok nevelésre, melyet minél fiatalabb korban kell elkezdeni.

Hozzáfűzés az eddig írtakhoz:

- also , too as well. Equally,……. Not only …., but also…..
- Moreover, …. Furthermore, ……. What's more, ….. Additionally, ……

Példák:
According to the nuclear lobby, nuclear energy is ***not only*** *economical,* ***but also*** *safe.*
(According to the nuclear lobby, nuclear energy is ***not only*** *economical, but* ***safe, as well / too.) Moreover /Furthermore / What's more****, there are huge amounts of uranium available on our planet, so it will not run out for a long time.*
Az atomenergia-lobbi szerint a nukleáris energia nemcsak gazdaságos, hanem / de **biztonságos is.** Továbbá / Ezen túlmenően / Sőt mi több / Ráadásul **nagy mennyiségű uránium található a Földön, tehát sokáig elegendő lesz a készlet.**

Áttérés egy új, vagy jóval régebben leírt témára:
As for….. With reference to…..

Példa:
There are several types of alternative energy sources: wind energy, tidal, wave energy, geo-thermal energy and so on. There are attempts to make the production of these more and more economical. ***As for / With reference to*** *nuclear energy, there are debates whether it is worth increasing its production volume, since this sort of energy is considered to be very economical, but there are doubts about the safety of the disposal of nuclear waste.*
Többféle alternatív energiaforrás létezik: szél, árapály, geotermikus energia, stb. Igyekeznek ezek termelését egyre gazdaságosabbá tenni. **Ami a** nukleáris energiá**t illeti,** viták folynak arról, hogy megéri-e növelni az atomenergia termelésének volumenét, mivel ugyanez az energia gazdaságosnak tekinthető, de kétségek vannak a téren, hogy biztonságosan lehet-e tárolni a nukleáris hulladékot.

Összefoglalás:
In short, ….. Briefly, ……
In summary, ……. To sum up, ……..
Példák:
The conference on endangered animals had 23 lectures, 10 workshops and 5 poster presentations on various aspects of disappearing habitats of these animals, their hunting, poaching and illegal trade. It is impossible to describe all of them, but ***briefly / in short,*** *we can say that all of them urged to take action before it is too late, and the endangered animals become extinct.*
A veszélyeztetett állatokról rendezett konferencián 23 előadás, 10 workshop és 5 poszter-prezentáció volt az állatok élőhelyeinek eltűnéséről, a vadászatról, az orvvadászatról és az illegális állatkereskedelemről. Lehetetlenség minden előadást leírni, de **röviden elmondhatjuk**, hogy valamennyi előadó sürgetőnek nevezte, hogy cselekedjünk, mielőtt túl késő lenne, és a veszélyeztetett állatok kihalnának.

At the end of an essay: ….. *In this essay, I have described the advantages and disadvantages of boycotting large companies which conduct unfair trading with some developing countries.* ***In summary, / To sum up****, I think everybody should be aware of these facts and everyone should decide as their conscience dictates it.*
Fogalmazások végén: …. Fogalmazásomban leírtam annak az előnyeit és hátrányait, hogyha bojkottáljuk azon nagyvállalatokat, amelyek túl alacsony áron vásárolják áruikat néhány fejlődő országból, ezzel kizsákmányolva azokat. ***A fentieket összefoglalva, / Összegezve a fent elmondottakat, / Mindent egybevetve / Összefoglalásképpen***: szerintem mindenkinek tudnia kell ezen tényekről és aztán mindenkinek saját lelkiismerete szerint kell döntenie.

Magyarázat:

That is to say, …… , that is, (i.e.) , in other words,

Példa:
An excellent source of renewable energy is geothermal energy, ***that is / i.e. / in other words,*** *the energy of the heat of the Earth.*
A megújítható energiaforrások egyik kiváló fajtája a geotermikus energia, **azaz / vagyis** a Föld hőenergiája.

Példa állítása:

for example, (e.g) , such as ….

Példa:
Animal welfare issues, ***for example / e.g. / such as*** *animal testing, have come to the forefront of public debates in Great Britain.*
Az állatvédelemmel kapcsolatos kérdések, **mint például** az állatkísérletek ügye, a nyilvános viták előterébe kerültek Nagy-Britanniában.

Választás:

, or ……	**, rather ……**	**, or rather……**
either ……. , or…	neither…….., nor …..	
Alternatively, ……	On the other hand, …….	

Példák:
We should decide: to raise funds through a charity ball ***or*** *through a sponsored marathon.*
Döntenünk kellene: jótékonysági bál **vagy** szponzorált maratoni futás útján gyűjtünk pénzt.

Let's vote for ***either*** *the charity ball* ***or*** *for the sponsored marathon.*
Szavazzunk **vagy** a jótékonysági bálra **vagy** a szponzorált maratoni futásra.

I don't support ***either*** *the ball* ***or*** *the marathon,* ***rather*** *a charity concert.* ***Alternatively****, we can have a charity auction to be able to help the starving.*
Nem támogatom **sem** a bált, **sem** a maratont, **inkább** a jótékonysági koncertet választanám. **Vagy esetleg** rendezhetünk egy jótékonysági aukciót, hogy segíthessünk az éhezőkön.

Neither *the ball,* ***nor*** *the marathon gained the members' support.*
Sem a bál, sem a maraton nem nyerte el a tagok támogatását.

The charity ball might attract a lot of people. ***On the other hand****, a pop concert might interest even more.*
A jótékonysági bál sok embert vonzhat. **Másfelől** egy popkoncert még több embert érdekelhet.

Ok megjelölése:

, since ……. , as …… , for …… , because…
, because of ….

Példák:
Because of *the floods, several thousands of people had to be evacuated in Prague.*
Az árvíz **miatt** Prágában több ezer embert kellett kitelepíteni.

Several thousands of people had to be evacuated, ***since / as / for / because*** *the floods seriously endangered the centre of Prague,*

Több ezer embert kellett kitelepíteni, ***mivel / mert*** *az árvíz komolyan veszélyeztette Prága belvárosát*

Okozat megjelölése vagy következtetés levonása: (a + jelűek egy önálló mondat elején vagy egy tagmondat elején egyaránt állhatnak.)

+Therefore, …… +Thus,…….. Hence, …….. (, so ….)
As a result……., As a consequence, ……..
+Consequently, ……. +Accordingly, ……
+Or else ……. +Otherwise,… If……. , then….

Példák:
For the last hundred years the climate has been growing much warmer. ***As a result, / As a consequence, / Therefore, / Thus, / Hence, / Consequently / Accordingly,*** *the vegetation has also been changing.*
Az utóbbi évszázadok során az éghajlat sokkal melegebbé vált. **Ennek eredményeképpen / Ennek következményeképpen / Tehát / Ily módon / Így hát / Következésképpen / Ennek megfelelően** a növényzet is változik.

If *the climate becomes much warmer,* ***(then)*** *the vegetation changes accordingly.*
Ha az éghajlat felmelegszik, **(akkor)** a növényzet is ennek megfelelően változik.

Houses should be well insulated, ***otherwise / or else*** *the heat will escape.*
Véleményünk szerint a házakat jól kell szigetelni, **máskülönben / különben / egyébként** a hő elvész.

Ellentétes értelmű kötőszavak:

+But
By contrast, …. , whereas….. , while …… +On the contrary,
On the one hand…….On the other hand
However,…… Nevertheless,… +Still, …. +Yet, …….
+Though …. / +Although …. / + Even though, In fact, though
+In spite of +Despite

Példák:
*Experts say there are unlikely to be major food shortages in India in the short term, **but** the drought could spark problems later.*
Szakértők szerint nem valószínű, hogy rövidtávon komoly élelmiszerhiány lépne föl Indiában, **de** a későbbiekben az aszály problémákat okozhat.

*Experts say there are unlikely to be major food shortages in India in the short term, due to a surplus in production last year. **But** the drought could spark problems later, as fears grow that a long dry spell may affect wheat sowing in October.*
Szakértők szerint a tavalyi túltermelésnek köszönhetően nem valószínű, hogy rövidtávon komoly élelmiszerhiány lépne föl. **Azonban** a későbbiekben az aszály problémákat okozhat, mivel egyre félőbb, hogy a hosszú száraz időszak hatással lehet a búza októberi vetésére.

*One of the biggest problems of the developing countries is food shortage. **By contrast,** in Western countries there is a vast amount of surplus food.*
A fejlődő országok egyik legnagyobb problémája az élelmiszerhiány. **Ezzel ellentétben,** a nyugati országokban nagy élelmiszerfeleslegek vannak.

*One of the biggest problems of the developing countries is food shortage, **while / whereas** in Western countries, (**on the contrary**,) there is a vast amount of surplus food.*
A fejlődő országok egyik legnagyobb problémája az élelmiszerhiány, **míg / amikor pedig** a nyugati országokban (**ezzel ellentétben**) nagy élelmiszerfeleslegek vannak.

*The situation in the developing countries is very complex. **On the one hand**, they need urgent food aid to survive the drought and famine. **On the other hand**, food aid destroys their agriculture in the long run.*
A fejlődő országokban nagyon bonyolult a helyzet. **Egyfelől** sürgős élelmiszersegélyekre van szükségük, hogy túléljék az aszályt és az éhínséget. **Másfelől** viszont az élelmiszersegélyek hosszútávon elsorvasztják a mezőgazdaságukat.

On the beaches of Great Britain there are signs to warn people to throw their litter in the bins provided.** However, / Nevertheless, / Still, / Yet / **thousands of tourists litter these beaches, causing unnecessary harm and danger to animals.
Nagy-Britannia partjainál táblák figyelmeztetik az embereket arra, hogy a kihelyezett szeméttartókba dobják a szemetet. **Ennek ellenére / Mégis** turisták ezrei szemetelik tele ezeket a partokat, és ezzel szükségtelenül veszélybe sodorják az állatokat.

*Although / Though / Even though/ In fact, though **there are signs on the beaches of Great Britain to warn people to throw their litter in the bins provided, thousands of tourists litter these beaches, causing unnecessary harm and danger to animals.***
Habár / Bár / Még ha Nagy-Britannia partjainál táblák figyelmeztetik **(is)** az embereket arra, hogy a kihelyezett szeméttartókba dobják a szemetet, turisták ezrei szemetelik tele ezeket a partokat, és ezzel szükségtelenül veszélybe sodorják az állatokat.

***In spite of / Despite** the Aswan dam, a lot of Egyptian farmers near the Nile do not have access to water for irrigation.*
A Nílus mellett lakó gazdák közül sokan az asszuáni gát **ellenére sem** jutnak öntözővízhez.

***In spite of / Despite the fact that** the Aswan dam is the biggest such structure in the region, a lot of Egyptian farmers near the Nile do not have access to water for irrigation.*
Annak ellenére, hogy az asszuáni gát az egyik legnagyobb ilyen jellegű építmény a régióban, a Nílus mellett lakó gazdák közül sokan nem jutnak öntözővízhez.

Táblázatleírás feladatok

Task 1

Study the table, and describe it in 150-200 words, according to the example (0). The description should include tendencies and comparisons.The description should end with a conclusion or prediction.

Fertiliser consumption in Sri Lanka (2010)

It is growing under the influence of agro-chemical companies; figures in tonnes

Description	Urea	Triple super phosphate	Muriate of potash	Total
Paddy	308,000	100,000	93,000	501,000
Tea	100,000	37	26,000	126,037
Rubber	3,050	20	2,057	5,127
Coconut	5,340	72	8,156	13,568
Other field crops	2,580	2,247	5,295	10,122
Vegetables	3,287	947	2,355	6,589
Export agriculture sector	808	218	1,109	2,135
All other sectors	14	10	16	40
National consumption	423,079	103,551	137,988	664,618
National requirement	553,400	134,675	248,700	936,775

Source: Sri Lanka National Fertilizer Secretariat

Example: This is a table which was published by the Sri Lanka National Fertilizer Secretariat.

Study the table, and describe it in 150-200 words, according to the example (0). The description should include tendencies and comparisons.The description should end with a conclusion or prediction.

Agricultural production in Zimbabwe, 2014

TABLE 5

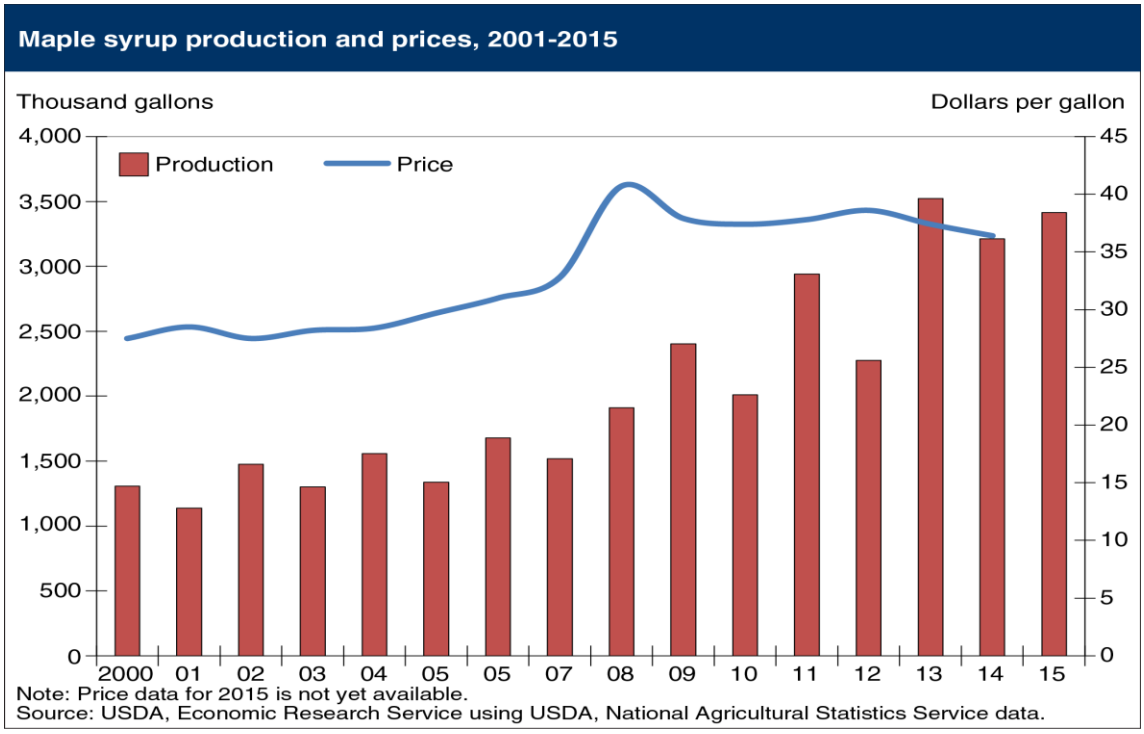
Average yields of main crops in Zimbabwe

Crop	Dry land yield (tonnes/ha)	Irrigated yield (tonnes/ha)
Maize	1.6	5.8
Groundnuts	0.5	2.7
Soybeans	1.4	2.4
Cotton	0.8	2.4
Tobacco	2.0	2.9
Sugar cane	**	110
Wheat	**	5.2
Barley	**	5.0
Beans	1.0	1.3
Coffee	1.2	1.7
Tea	2.8	3.2
Tomatoes	**	20

*** Crop not normally grown under dry land*

Example: This is a table which shows the average yield of the main crops produced in Zimbabwe, under dry and irrigated conditions.

Study the graph, and describe it in 150-200 words, according to the example (0). The description should include tendencies and comparisons.The description should end with a conclusion or prediction.



Example: This is a graph whick depicts maple syrup production and prices form 2001-2015 in the United States.

WRITING TASKS

Task 2

READERS' LETTERS

1. The agricultural journal called „Choices" published an article about the effect of the banning of certain nitrogen-based fertilisers on different sectors of agriculture and industry. Write a reader's letter to the journal in 180-200 words based on the points below. Your name and address in this role is the following: Barabás János/ Janka, H-6725, Szeged, Tiszai körút 34.

In your letter, include

- your opinion about the ban
- your opinion about the value of possible alternatives
- conflicting interests of different agricultural and industrial sectors

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2. You produce organic wines in your vineyard. Write a reader's letter to the journal "English Horticulture" in 180-200 words to ask the editors to devote an article to organic vines. Write some arguments based on the points below.
Your name and address in this role is the following: Boronkai Irén/ Imre, H-3910 Tokaj, - Rákóczi u. 15.

In your letter, you should describe

- the effects of the overuse of nitrate and phosphate fertilisers
    - in the soil and in the grapes
    - in the taste of conventionally produced wines
- By contrast, mention the health benefits of organic wines

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3. You work as an expert for Hungarian extension services, and you follow the English articles about relevant topics. You would like to comment on an article which claimed that the countries which joined the EU as a result of the enlargement cannot keep pace with the other members. Write a reader's letter in 180-200 words based on the points below.
Your name and address in this role is the following: Miskolczi Péter / Petra, 1196 Budapest, Ady Endre u.16.

In your letter, you should

- admit some of the dangers facing Hungarian agriculture
- mention the expected effect of EU support
- write about the reserves in increasing the efficiency of production

MOTIVATION LETTER / LETTER OF APPLICATION

1. The University of Syracuse offered a grant to support a talented student from Central or Eastern Europe, covering his or her tuition fee for an academic year. Write a letter of application in 180-200 words. Address the letter to Gordon Gates, Head of Graduate Enrolment, Management Center, 303 Bowne Hall, Syracuse University, NY 13244, USA. Your name and address in this role is the following: Varga Ilona/ Imre, 9200 Győr, Béke u.24

In your letter, include

- your current studies and goals
- any professional activities you are involved in
- your career plans.

REPORTS

1. You work as the marketing manager for Interfood Ltd in Manchester. The profile of the company is the sale of bakery products and sweets, dairy products and fruit. The company is about to introduce a new product line, namely, dried fruit and products with dried fruit. Write a report in 180-200 words to the CEO about the results of the market research, based on the points below. Your name in this role is Kormos Géza/ Gizella.

In your report, include

- the needs, wants and demands resulting in your survey
- how you imagine the first steps of marketing the new products
- how and where you would advertise and promote them.

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2. You are an independent Health and Safety expert in England, who is hired by the authorities to conduct checks at agricultural producers. Write a report in 180-200 words about your last visit on a dairy farm. (Owen's Dairy, Shropshire). Your name and position in this role is Robert/Roberta Tellér, Health and Safety Inspector. Address the report to: Michael Brown, Head of Department of Health and Safety Department, Agricultural Standards Agency.

In your Health and Safety report, include

- the description of potential hazards on the farm
- measures taken by the farm management to prevent the dangers
- your overall evaluation and recommendations concerning the health and safety practices of this farm.

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3. You work for a fruit farm in England as a supervisor. The owner, David Bolton, is very worried about the announcement of the British Home Office that they are going to limit the number of seasonal guest workers allowed in the country. He is asking for a report of 180-200 words based on the points below. Your name in this role: Bérczi Andrea/András.

In your report, include

- summary of the new measure concerning seasonal workers
- possible consequences (lack of local workers, extra expenses, crop in danger)
- your recommendations (recruiting from elsewhere, pick-your-own campaign, etc.)

ANSWER KEYS
AGRICULTURAL TOPICS

1. Finnish forests

Task 1

1. F, 2. T, 3. T, 4. F

Task 2

5. Damage, 6. Embargo, 7. Dispersion/infection, 8. Insects survive, 9. Heat treatment, 10. International contracts

2. Let's keep the genie in its bottle

Task 1

1-E, 2-A, 3-G, 4-B, 5-F, 6-H

Task 2

7. Horizontal gene transfer, 8. Genetic pollution/threats to health, 9. Unexpected food allergies can break out, 10. Increased herbicide use/intensifying of agriculture,

3. Onions at Wisley

Task 1

1-F, 2-C, 3-D, 4-B

Task 2

5. Not enough light, 6. Fluffy, white fungal growth on bulb and root, 7. Not growing susceptible crops for 15 years, 8. Grow susceptible crops in containers, 9. Fluffy or mealy grey/violet fungal growth, 10. Avoid overhead watering,/. Spraying with fungicide

4. Sustainable projects for smallholders

Task 1

1. "packages (new management practices+crop varieties) were not suitable for farmers' circumstances, 2. lack of co-ordination between participating institutions, 3. supply-driven approach, 4. participatory approach, 5. new crop varieties, 6. improved management practices (Or: technologies+ suited to local needs+ in collaboration), 7. low- income farmers, /. society as a whole/local and national policy makers, /national (research institutions) /planners and policy makers

Task 2

8. F, 9. T, 10. F

5. How „green" are our veg?

Task 1

1-F, 2-B, 3-D, 4-C, 5-E

Task 2

6 To avoid pesticide residues in food, 7. Small amount of permitted residue, 8. Stomach cancer, 9. Safety of consumer, 10. Children, 11. Effects on animals, water, air, soil, 12. Campaigning document to organic production, 13. Consumer's Association in its Which? Magazine. 14. increase the intake of food 15 vegetables

6. Italy can temporarily ban GM foods but must provide sound evidence of the dangers

Task 1

1. Monsanto, 2. ECJ, 3. Greenpeace, 4. Italy, 5. Monsanto, 6. ECJ, 7-8: Italy, Monsanto

Task 2

9. On August 2000, 10. Making it resistant to certain herbicides and pests simplified, 11. Italian scientists found residues of GMO proteins, 12. If it is equivalent to the conventional variety and there is no evidence of a risk to consumers, 13. Not to let themselves bully into accepting these products, 14. Scientific, 15. political

7. Cattle feeding change could cut *E. coli* risk"

Task 1

0-B, 1-C, 2-B, 3-A, 4-C, 5-A
Task 2
6. intestinal illness /diarrhea, 7. kidney failure, 8. acid- resistant, 9. reaches colon, 10. are fermented, 11. acids accumulate, 12. carbohydrates of hay are not easily fermented / cheap and convenient, 13. it does not promote the growth of acid-resistant *E. coli* / these cattle have only acid-sensitive *E coli*, 14. Before maturity, 15. Acid-resistance gene

8. Septoria lessons for this season
Task 1
0-A, 1-C, 2-B, 3-C, 4-A, 5-B
Task 2
6 exceptional pressure, 7. working in disease's favour, 8. working against control methods, 9. spread to less sensitive types, 10. (used) straight triazoles, 11. low doses /not enough, 12. late (timing), 13. SDHI fungicides, 14. pre-T2 fungicide to protect leaf 2, 15. putting it / high doses on the flag leaf

9. Waste Not, Watt Not
Task 1
1. manure, 2. burp, 3. solves the manure waste problem, 4. expensive to install, 5. difficult to capture it, 6. global warming/ greenhouse effect
Task 2
7-T, 8-F, 9-F, 10-T

10.Wheat that's tailor-made for your farm
Task 1
1. uniform stand, 2. even performance, 3. higher yields, 4. resistant to environmental stress
5. diseases, 6. producing populations by crossing varieties, 7. resowing seeds of population
8. comparing populations with parents, 9. natural selection, 10. producing cold-tolerant offspring/ top yielding line, 11. adding / introducing new varieties
Task 2
12-T, 13-F, 14-T, 15-F

ENVIRONMENTAL TOPICS

1. China Trying to Curb Acid Rain
Task 1
1-B, 2-D, 3-C, 4-A, 5-D
Task 2
6. Sulfur dioxide emission trade, 7. 3 years, 8. In 2006, 9. SEPA, 10. Development, further expansion,

2. One Percent of U.S. Coal Plants Closed to Avoid Pollution
Task 1
1-A, 2-C, 3-B
Task 2
4. (69%) NOx reduction, 5. (67%) SO2 reduction, 6. $27 billion annual savings / fewer deaths/ fewer asthma- and heart attacks, 7. solar installation, 8. (waste treatment) methane gas capture, 9. hybrid electric charging stations, 10. following their example / follow suit

3. Chemical residues
Task 1
1-F, 2-B, 3-H, 4-A, 5-G, 6-D
Task 2

7. Substances of very high concern, 8. These substances are passed on to children during pregnancy and breast-feeding, 9. Endocrine disrupters / hormone disrupting, 10. No applications for the authorization of these substances will be accepted,

4. Food safety

Task 1

1. identifies/ predicts all possible problems, 2. trained (literate) staff / funds, 3. transmit known allergens, 4. microbial contamination, 5. Codex (taskforce, 6. equivalence, 7. sold elsewhere

Task 2

0-A, 8-A, 9-C, 10-B

5. North Sea scientists fishing for facts

Task 1

1. T, 2. F, 3. T

Task 2

4. exaggerated, 5. disappearing, 6. surviving /remaining, 7. examining /studying / investigating, 8. cannot be forecast / is inexplicable, 9. haddock, 10. fishermen's data / reports / observation

6. Waste water harnessed to make electricity and plastics

Task 1

1.microbial fuel cells, 2.methane, 3.raw material for biodegradable plastics /production of biodegradable plastics, 4.far more electrodes, 5.uses GM bacteria, 6.expensive and complex process

Task 2:

7, T, 8, T, 9, F, 10. F

7. Ecologists warn the planet is running short of water

Task 1

1. peak ecological water, 2. wars/ violence, 3. less, 4. Ganges-Brahmaputra, 5. good water management, 6. unconstrained/inadequately regulated economic expansion

Task 2

7-T, 8-T, 9-F, 10-F

8. Arctic ice thickness 'plummets'

Task 1

1. radar altimeter / electromagnetic, 2. overall/full coverage, 3. continuous, 4. logistic, 5. uneven / increasing, 6. ice redistribution / ice piling up on the coast, 7. melting

Task 2

1-C, 2-A, 3-B

9**. Winds of change**

Task 1

1-F, 2-T, 3-T

Task 2

4. on top of the windmills, 5. winds of higher speed, 6. birds flying into blades, 7. avoid shipping lanes, 8. military radar interference, 9. cost of plugging it into national grid would be higher than gains, 10. wind does not blow all the time /changeable weather

10: The energy performance certificate

Task 1

1-A, 2-B, 3-A

Task 2

4. old, historic/ listed buildings, 5. Heating/ insulation, 6. non-visible information (e.g. cavity insulation), 7. total floor area, 8. with a single letter (on an A-G scale), 9. Home Inspectors, 10. Domestic Energy Assessors