

國立嘉義大學九十六學年度  
生物資源學系碩士班招生考試試題

科目：專業英文

閱讀與表達，意譯或直譯皆可：(每題 25 分，共 100 分)

1. Biodiversity management in an agricultural setting has recently become a focus of conservation biology. About 37% of the globally available land area is agricultural, and a predicted additional  $10^9$  hectares of land will be required by 2050 to produce the 50% increase in production required. Thus, a substantial proportion of total biodiversity is associated with farming and, given that agricultural intensification has reduced biodiversity, it is under considerable threat. Biodiversity on nonagricultural land is also affected by the quality of farmland as it forms the landscape matrix between fragments of suitable habitat. Degradation of the matrix through agricultural intensification can therefore affect species dispersal between patches and hence the survival of all the local populations in a region. During the 1970s and 1980s, a marked decline in the abundance of species that are strongly associated with farmland, especially birds, created considerable alarm.
2. Damage caused by whitefly makes it “the worst problem in regions of Africa, Asia and South America”. The flies’ increased resistance to pesticides and indifference to drought- many actually prefer things hot and dry- make them a grave threat to crops in parts of the developing world. Elsewhere, international trade has put tomatoes in Japan, cassava in Africa and soybean in Australia at increase risk.  
In the worst infestation, the flies can form visible clouds, coating windscreens and clogging the mouths and nostrils of field workers. Not only does the fly kill flowers, vegetables and cotton, it spreads viruses that are equally deadly in plants. The high doses of pesticides used in attempts to control them do more collateral damage to the insects that feed on whitefly- such as ladybirds- than to the whitefly themselves.
3. As soon as scientists realized the power of DNA technology, they began to worry about potential dangers. Early concerns focused on the possibility that recombinant DNA technology might create new pathogens. To guard against such rogue microbes, scientists developed a set of guidelines that were adopted as formal government regulations in the United States and some other countries. One safety measure is a set of

strict laboratory procedures designed to protect researchers from infection by engineered microbes and to prevent the microbes from accidentally leaving the laboratory. In addition, strains of microorganisms to be used in recombinant DNA experiments are genetically crippled to ensure that they cannot survive outside the laboratory. Finally, certain obviously dangerous experiments have been banned.

4. Rice is an indispensable staple food, especially in the large areas of Asia, Latin America and Africa that are characterized by a semitropical climate with alternating rainy and dry seasons. Since the beginning of agriculture, rice plants have been adapted for a wide range of environmental conditions through continuous breeding and selection. Worldwide, more than 120,000 rice varieties have been bred to satisfy demands ranging from high yield potential, disease resistance, tolerance to stresses, good eating quality and increased nutritional value. Two of the best-known success stories are the introduction of semi-dwarfism in the late 1960s by the International Rice Research Institute in the Philippines, which propelled the Green Revolution, and the development of hybrid rice technology in the mid-1970s in Hunan, China. Together, these developments have had astounding results: rice production has doubled over the past 40 years.