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Final Exam – Dec 5, 2005
AgBiotech Issues – BI/FS 430/530 (H)

Short Answer

1. What are two enzymes used to cut genes from DNA and join them to parts of other genes? (2 pts)

2. What does it mean to “clone” a gene? (2 pts)

3. What are two methods for cloning genes? (hint: one uses an organism directly and the other does not) (2 pts)

4. What are two examples of crops for which irradiated genomes were used in their breeding? (2 pts)

5. What is biomonitoring? Give one pro and one con argument for biomonitoring. (3 pts)

6. Define sustainable agriculture. (2 pts)

7. What is the difference between natural capitalism and industrial capitalism? (2 pts)

8. What species is the wild progenitor of maize? (2 pts)

Name _____

9. What are two major changes that occurred to maize during its domestication? (2 pts)

10. Can maize and its wild ancestor exchange genes? (2 pts)

11. Why did Potrykus seek to insert genes for pro-Vitamin A in rice when pro-Vitamin A can already be found in rice plants? (2 pts)

12. Fedoroff claimed that Bt should not really be called a “toxin” in public discussions. Why do you think she believed this (if you do not know, make this clear and suggest a reasonable explanation)? (2 pts)

13. What are the two main components of risk assessment in toxicology and what is their basic mathematical relationship? (2 pts)

14. Define and give one example of a metabolic modifier used in animal agriculture. (2 pts)

15. Give one benefit and one risk of using transgenic animals. (2 pts)

16. What is the Flavr-Savr tomato and why is it important in the history of GMOs? (2 pts)

17. Who was Pusztai, what study is he famous for, and why were his results so controversial? (2 pts)

Name _____

18. What are the three main traits in GE crops commercially available today? (3 pts)

19. What are two of the fundamental principles of organic agriculture? (4 pts).

20. What are two ways to genetically engineer (ie, insert genes into) a plant? (4 pts)

21. What is the *lead* agency responsible for assessing safety of insect resistant crops and what are two kinds of studies used in the assessment of their human and environmental safety? (4 pts)

22. Why does Fedoroff mean by the title of chapter 11: “pollen has always flown.” (4 pts)

23. What agency is responsible for regulating whether GM foods are safe to eat? What is meant by substantial equivalence? (4 pts)

24. Give two arguments for and two arguments against the labeling of GM foods. (4 pts)

25. Give two pro and two con arguments on the use of transgenic fish (4 pts)

Name _____

26. Describe two benefits and two concerns about the cloning of animals. (4 pts)

Short essay

27. What were two reasons behind the rapid adoption of DDT and two reasons is it no longer used in most parts of the world? Cite one use that is still allowed in some places? (6 pts)

28. How and why is irradiation used in crop breeding? Are crops bred using irradiation regulated in a similar way to GMOs? Do you think they should be regulated in the same way (give and explain at least one biological reason for and one biological reason against such regulation)? (6 pts)

Name _____

29. What is biopharming and what is its goal? Give two benefits and two risks of biopharming? Who regulates field trials, and are they regulated more or less stringently than other kinds of GMOs? (6 pts)
30. What were the “farm scale evaluations” in the UK, what GM crops were used, what was its basic design, and what were the overall conclusions? (6 pts)
31. Describe the controversy over the monarch butterfly and the introduction of BT corn in the USA? What were the results of the initial experiment and the subsequent follow-up studies? What questions or concerns still remain? (6 pts)