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**R7G**

**ETHICS IN CROP PRODUCTION AND AGRICULTURAL BIOTECHNOLOGY**

Crop production has advanced through technology, enabling scientists to develop more accurate and powerful tools (biotechnology) to yield crops with selected traits that benefit farmers and consumers. Developments and applications in biotechnology must include ethical considerations because food that has been genetically modified or engineered, either directly through recombinant DNA (rDNA) methods or by selective breeding, impacts on humankind, society, and the environment.

To quote Thompson (2000): “Those who call for attention to ethical issues appeal to many diverse values. Their concerns can be classified into two broad categories. On the one hand, some see the act of using genetic technology raising ethical issues that would not apply to other food and agricultural technology applications. On the other hand, some believe that specific biotechnology applications raise ethical issues that are not being adequately addressed, even if these issues may be raised in connection to other, more conventional types of agricultural technology as well.

*Special Arguments Pertaining to the Use of rDNA Technology*. Those who question whether the use of biotechnology may be intrinsically questionable note several types of concern. Genes and Essences. Longstanding religious and cultural traditions associate the idea of a particular Aessence@ with different species of living organisms and specify an obligation for human beings to respect these essences. Some may associate the modern notion of genes with this traditional notion of essence.

- Species Boundaries and Natural Kinds. The idea that there is a specified order of nature@ may involve the belief that the species of plants and animals we find around us represent natural “kinds”. Some may fear that biotechnology disturbs this order and violates absolute limits on what humans are ethically permitted to do.

- Religious Arguments. Many religious traditions prohibit acts that involve transspecies reproduction or ban the consumption of some species groups for food and the mixing of foods from different groups. Biotechnology may be interpreted as contrary to some of these religious traditions.

- Emotional Repugnance. Cultural traditions dictate that some potentially consumable substances (e.g. species such as cats and dogs or particular parts of plants and animals) are not suitable for use as food. Western food systems currently respect the repugnance that people feel toward these substances as a sufficient ground for policies that help people avoid consuming them. Some individuals may feel a similar repugnance toward bioengineered foods.

*General Technological Ethics*. Several ethical questions can be raised with respect to virtually any new food or agricultural technology. As they are raised in connection with biotechnology, these questions suggest the following types of ethical concerns:

Environmental Ethics. Technology raises environmental issues when environmental exposures pose risks to humans, wildlife, or ecosystem integrity. It has been alleged that agricultural biotechnology may pose risks to wildlife in or near farm fields. There are also issues associated with whether agricultural ecosystems can exhibit features of ecological integrity.

- Food Safety. Many of the issues associated with the safety of eating bioengineered foods are technical, but whether regulators should make this decision based on an assessment of the risks or whether individual consumers should be placed in a position to make the choice themselves is an ethical one.

- Moral Status of Animals. If genetic engineering of livestock would compromise animal welfare, there are ethical questions that can be raised. There are also questions about whether it would be ethical to use biotechnology to make animals more tolerant of production settings currently regarded as inimical to animal welfare.

- Impact on Farming Communities. Some critics of agricultural biotechnology have alleged that it will contribute to farm bankruptcies and the depletion of the farming population in rural communities. There has been a longstanding ethical debate as to whether technology or policy that affects farming communities can be ethically justified by offsetting benefits in the form of efficient production and lower food prices. The concern is particularly relevant to the impact of biotechnology in developing regions where many farms are at the subsistence level.

Shifting Power Relations. Related to the concern about farming communities, some have argued that biotechnology will help a few well-capitalized firms control decision-making in agriculture (including future research) and limit farmers’ ability to choose from an array of production possibilities. This concern is related to a general ethical concern with the distribution of economic power and wealth in democratic societies.

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| **INSTRUCTIONS**   * The application must be typed. * This form must be submitted with a R7a. |

1. **PROJECT**

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| **Start date and anticipated completion date.** | |
| **Start:** | **Completion:** |
| 1. **Rationale and objectives: Briefly explain why the study will be conducted and which scientific question(s) will be addressed. Who will benefit from the results of this project?** Suggested length: 200 words | |
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| 1. **Explain briefly which methods will be used for your study.** | |
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| 1. **How are the potential risks to human health determined?** | |
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| 1. **What are the main issues of concern for human health?** | |
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| 1. **How is the risk assessment for the environment performed?** | |
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| 1. **What are the issues of concern for the environment?** | |
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| 1. **How are GM foods regulated nationally?** | |
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| 1. **Are there implications for farmers' rights to own their crops?** | |
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| 1. **Is genetic engineering (GE) the only way to increase food production?** | |
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| 1. **Is it possible to deal with widespread malnutrition with genetic engineering?** | |
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| 1. **If food security is primarily a question of distribution insecurity, how can increased production using GE address the question of food security?** | |
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| 1. **How can GE ensure environmental sustainability and increase food production when pressure on environmental resources like land and water is growing?** | |
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| 1. **Won’t herbicide-tolerant and pesticidal GE crops lead to intensified use of agrochemicals?** | |
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| 1. **What is the sound scientific basis for considering GE to be safe?** | |
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| 1. **Is there a difference between biotechnology applications in agriculture and medicine? Why are the two perceived differently?** | |
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| 1. **How can modern profit-driven agricultural biotechnology meet the basic needs of the poor?** | |
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1. **SIGNATURES**

I have considered the design of this project, and in my opinion, this is the most effective and feasible protocol that has the lowest impact on the animals and the environment. This work is being conducted according to the ethical standards accepted in this field of research.

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**Applicant’s Name** **Signature Date**

**Other researchers involved in this project:**

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Name and Surname Signature Date

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Name and Surname Signature Date

**Project supervisor** *(Applicable for Student Projects)*

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Name and Surname Signature Date

**Research Ethics Committee resolution:**

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| **Approved** |  |
| **Not Approved** |  |

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Name and Surname Signature Date

Chairperson, REC