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Curriculum Units by Fellows of the National Initiative

2018 Volume V: Manipulating Biology: Costs, Benefits and Controversies

Feeding the World Using Genetically Modified Organisms: A Survey of GMO Technology and its Impact on Agricultural Production

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by Michael A. Doody

As human population size increases worldwide, agricultural yields must increase significantly to reduce and prevent undernourishment. Genetically modified organisms (GMOs) have the potential to help farmers increase yields even in the face of threats brought about by climate change. For example, engineered Golden Rice has been used to ward off vitamin A deficiencies in developing countries, while pest resistant Bt crops have been deployed worldwide. Additionally, drought, heat, and salt tolerant crops are being developed for use in areas threatened by a changing climate. Despite widespread agreement in the scientific community for their safe and effective use, GMOs still face considerable public resistance. This unit designed for Advanced Placement Environmental Science (APES), engages students in the connections between human population, agricultural practices, and GMOs. Students also explore the nature of the controversy surrounding GMO use. Ultimately students are tasked with developing an understanding of how GMOs can be used as part of a broader agricultural strategy to increase food production for feeding a growing population. Students use various Next Generation Science Standards Science and Engineering Practices (NGSS SEPs) to support learning, including “obtaining, evaluating, and communicating information,” “engaging in argument from evidence,” and “developing and using models.”

(Developed for AP Environmental Science, grades 11-12; recommended for Agricultural Science and Environmental Science, grades 9-11)

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