

Exposing Non-Majors to Agriculture through a General Education Life Science Course

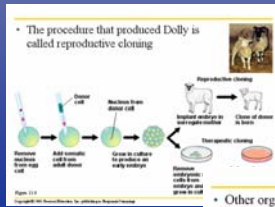


USU 1350 - Integrated Life Science

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Background

- "Integrated Life Science" can be used to meet the Breadth Life Science requirement of University Studies (General Education) for undergraduates.
- Faculty members from the related life sciences fields (including agriculture) can serve as instructors for the course.
- Affords opportunities to teach biology within the context of agriculture.



Other organisms have since been produced using this technique, some by the pharmaceutical industry.



Potential Benefits

- Through the agricultural applications used to teach biological concepts, students are exposed to the food, fiber, and natural resources industry and systems, thus increasing agricultural literacy.
- Anecdotal evidence and prior research suggests improved student attitude and achievement toward biological science as these concepts are taught embedded in real-world contexts.

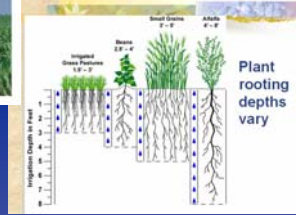
Good quality soil has:

- good aeration
- good drainage
- good tilth (easy to work)
- lots of organic matter
- lots of organisms.



Nutrient Deficiencies

Affects the growth of plants, and in turn, our own nutrition

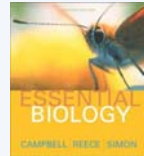


Most animals cannot derive nutrition from fiber

- How do grazing animals survive on a diet of cellulose?
- They have bacteria in their digestive tracts that can break down cellulose
- Hydrocarbons - fuel

Text and Course Materials

- We use Campbell, Reece and Simon's *Essential Biology* for the course.
- They have incorporated applications from agriculture, medicine and the environment.



Pharming

- Animals
- Goats with spider gene inserted - spider silk milk.
 - Chickens - egg white
- Crops
- Tobacco
 - Corn



Principal GM Crops

- Leading GE Crops (globally)
- Soybeans (61%)
 - Corn (23%)
 - Cotton (11%)
 - Canola (6%)

- US Crops (%GE)
- Soybeans (85%)
 - Corn (45%)
 - Cotton (76%)



GMOs Needed to Feed the Hungry?

- Increased Yields
 - Insect resistant GMOs may have higher yields dependent upon infestation rate
 - Yield drag for most GMOs (1-10%)
 - Is food production the real issue?
- Micronutrient deficiencies
 - Golden Rice



Future Plans

- Plans are in place to measure attitudinal changes in undergraduates enrolled in this course from the beginning to the end of the semester.

Part B: Perceptions toward Life Science

Directions: Please circle the number that best indicates the extent to which you agree or disagree with each of the following statements concerning your perceptions toward life science.

Statement	1	2	3	4	5
I enjoy life science courses.					
An understanding of the science is only for scientists.					
An understanding of life science is important for a functioning society.					
An understanding of life science is important to me.					
If I am not a scientist, I don't need to understand life science.					
I am more motivated to learn life science concepts when taught using "real life" applications.					
Life science concepts are easier for me to understand when taught using "real life" applications.					
The connections between life science and chemistry are apparent to me.					
The connections between life science and medicine are apparent to me.					
The connections between life science and the environment are apparent to me.					
The connections between life science and agriculture are apparent to me.					
An understanding of agriculture is only important for farmers and ranchers.					
An understanding of agriculture is important to me.					
An understanding of agriculture is important for a functioning society.					
If I am not a farmer, I don't need agriculture.					
I will be able to apply what I will learn (from lessons) in this class in my future.					

C₃ plants

- Close their stomata to save water during hot and dry weather
- Can still carry out photosynthesis

CAM plants

- Open their stomata only at night to conserve water

