

Combined Science - Biology- Key Stage 4
Bioenergetics

Manipulating Factors of Photosynthesis - Higher Tier

Miss Strmec



Independent Practice

1. What are the four limiting factors of photosynthesis?
2. Why is a greenhouse a good storage facility to increase light intensity for crops?
3. What process do the fungi do to increase the concentration of carbon dioxide in the greenhouse?
4. Why does the rate of photosynthesis decrease when the temperature increases past optimal?



Evaluate the method of manipulating factors:

- Putting the lights and the heat on may increase the rate of photosynthesis, but it costs a lot of money.
- Farmers would need to balance the cost of this with the increased revenue from their crops.
- There are also environmental issues linked with electricity use.

Advantages	Disadvantages



Independent Practice

Farmer John wants to increase the yield of his crops. He has heard that installing liquid carbon dioxide through his pipes will increase the concentration of carbon dioxide. But if too high, the crops may become acid to the point of toxic. He also wants to use artificial light to maximize the optimal wavelengths for photosynthesis. But he's not sure the expense would be offset by the increased crop production. He is also worried that the increased electricity use may be harmful to the environment.

Use the information provided to evaluate the methods Farmer John is using to manipulate the limiting factors of photosynthesis.

Advantages	Disadvantages



Independent Practice: Exam Style Question

Farmer John wants to increase the yield of his crops. He has heard that installing liquid carbon dioxide through his pipes will increase the concentration of carbon dioxide. But if too high, the crops may become acid to the point of toxic. He also wants to use artificial light to maximize the optimal wavelengths for photosynthesis. But he's not sure the expense would be offset by the increased crop production. He is also worried that the increased electricity use may be harmful to the environment.

Higher tier: Use the information provided to evaluate **AND EXPLAIN** the methods Farmer John is using to manipulate the limiting factors of photosynthesis.

Complete in full sentences for **6 marks**.

