Science & Technology in Agriculture Challenge

From the plow and selective breeding, to alternative fuels and robotics, American agriculture has seen numerous changes due to innovations in science, technology, and engineering. Some of these advancements have aided the American farmer in producing larger quantities of product on the same land area, or have allowed the production, transportation, trading, and retailing of agricultural products to be faster, better, or less expensive.

Your challenge is to imagine a new scientific, technical, or engineering innovation that will solve a problem. The problem can be one that exists now, or one that could happen in the future. Follow the process below as you consider the possibilities.

1. Define the Need
The first step is to identify a need that must be addressed. It could be a large, global problem such as world hunger, or it could be a situation that impacts you locally such as a polluted river or stream in your community. You could make a product taste better, or the workplace safer.

1. Brainstorm a list of agricultural problems or opportunities that exist now or may exist in the future. The problems or needs can relate to any facet of the agriculture industry, such as production, processing, transportation, marketing, financing, or retailing.
2. Based on your brainstorming, select one problem that you think science, technology, or engineering can play a part in solving.
   a. Describe the problem you are trying to solve or need that must be addressed. Why did you select it?
   b. Identify at least three stakeholder groups that are connected to the problem or need that must be addressed. For each, describe why they are a stakeholder and how they are currently impacted by the problem or need.

2. Find a Solution
Once you have identified the problem to be solved, find and describe a scientific, technical, or engineering innovation that meets the need.

1. Make a list of at least three possible scientific or technical achievements that could be applied to solve your problem. What is the best choice? Identify your choice and explain why it was selected.
2. Design a solution to the problem. There are many ways to do this such as drawing a sketch, writing a description, creating an outline, or creating a computer-based design. You may have to use your creativity to imagine a scientific or technological advancement that may not yet exist. Use appropriate method(s) to communicate your solution.

3. Consider the Impact
Any new innovation can have positive and negative impacts. A new technology could revolutionize the marketplace or help feed millions of people, or it could have environmental consequences or be too expensive for the marketplace. Explore the impacts of your innovation.

1. Identify at least two potential problems or challenges to implementing your design. Does the technology or science currently exist? Is it expensive? How might government policy/legislation impact the implementation of your design? How might you address these challenges?
2. Identify at least two risks with your innovation. Would there be any safety, environmental, economic, or ethical implications you would need to confront? If there are no risks, explain why.
3. What would be the impact of your idea? How will it benefit the stakeholders you identified? How will it solve the problem or need you identified? How would you measure this impact?

4. Make it Happen
Having an innovative idea is one thing, making it come to reality is another. Make a plan for creating and marketing your idea.

1. What steps could you take to make your idea a reality?
2. What are the types of costs involved to create your innovation?
3. What types of individuals or business would you need to make and market your idea? Create a list of 3-5 individuals or businesses you would need to work with in order to create and market your solution.