2019 Oral Presentation Problem Statement

Agriculture and the Environment: Knowledge & Technology to Feed the World

There are many articles that estimate the population of the Earth to be approximately 9 billion by the year 2050. One of the primary concerns for the agricultural industry is how will farmers be able to grow enough food to feed this growing population, while also protecting natural resources such as soil, water, air, wildlife, and plants.

Land Grant Colleges such as Cornell University in NY are working to prepare students interested in agricultural careers with understanding the concepts of how agriculture and all natural resource areas are interrelated, and how the use of new technologies will be key to increasing food production.

The Homer Vegetable Research Farm is the primary location for the College of Agriculture and Life Sciences' historically important vegetable research. The Homer Farm serves several departments, including Horticulture, Entomology, Plant Breeding and Plant Pathology. The 260-acre farm includes a 30-acre certified organic parcel (outlined on the attached map) for organic vegetable and grain research. The farm is managed for interdisciplinary research aimed at optimizing vegetable production systems for the Northeast.

As a student enrolled in a class titled “Agriculture of the future”, you have been assigned to a work group of 5 people to design and present to the Horticulture, Entomology, Plant Breeding and Plant Pathology department chairs a 5-year research project to increase farm efficiency for food production to be implemented at the farm. The project must include details to address the following considerations:

- Include which vegetable, grain crop or field crops that will be planted and the impacts of those species on mitigating climate change; reducing erosion and protecting water quality and quantity; or promoting pollination over the course of the project.
- Describe the farming practices that will be used to build soil organic matter to improve soil health and the impact of those practices on crop production and crop yields.
- Describe how integrated pest management and biological pest control techniques will be used to prevent or control insect pest, disease, and weed problems.
- Describe how new technology: agricultural biotechnology; precision agriculture; and using UAV (drones, GIS, etc.) will be used in all aspects of the project.

Additional information to be considered in the research project:

- Soil nutrient and pH information for 5 fields (as identified on the map) is available in the Custom Soils Report
- Soils information is provide in the Custom Soil Map and Report from Web Soil Survey
- All nutrients used in the project must comply with certified organic standards
- Irrigation is possible for most fields via the use of overhead sprinklers and/or drip lines. Hydrants are present near to most fields.
- Weather data for this farm is available at: http://newa.cornell.edu/index.php?page=weather-station-page&WeatherStation=fre