

Economic, Environmental, and Technological Impact

Economic Benefit

The economic benefit of this project is vast and wide-reaching. It provides more than just a business expansion for our operation; it allows us to serve our community by adding more pilots to our operation and allowing Randy to step away from piloting and focus on growing the business by acquiring new customers, as well as to have more time for his administrative duties. We plan on hiring between three and four part-time local pilots. This grant would also allow us to spend more time conducting economic trials with local growers, focusing on what products make their operation the most profitable. These trials may include using various types of products, timeliness of the application, and amount of product applied. The broader economic benefit of this project consists of the support of local businesses, such as the purchase of these drones from a Nebraska-owned agricultural drone dealer, our local bank, where we would be procuring our loan for the drones and related equipment, the chemical retailer from which we are procuring our chemical and fertilizer, the local welding shop that would be building the observation deck for our trailer, and the locally-owned hardware store where we get various supplies including plumbing, fittings, lumber, and miscellaneous hardware.

Economic and Technological Impacts

One of our primary goals is to continue growing our business by expanding to cover as many acres as possible. As we mentioned, we plan to build a trailer with a flight deck to increase productivity and profitability further. This will allow us to hire and use more pilots, leading us to buy more drones to lead us to a more sustainable future.

Another economic and environmental impact of spray drones is the fuel usage required for operations. The generator needed to charge the batteries for the drones only uses 2.5 gallons per hour versus a self-propelled sprayer that uses around 16 gallons per hour. Using agricultural spraying and spreading drones creates no compaction while passing across the field. With the rapid expansion of this technology, one of the long-term benefits of this project is that over the next several years of this project is that R&C Drone AgSpray will need to expend

even more than we currently are. This has the potential to create a long-term economic impact not only in northeast Nebraska but across the entire state of Nebraska.

Water Conservation

Our long-term goal is to use less water than a traditional ground sprayer. In liquid application, we typically apply 2-3 gallons to the acre compared to a typical ground sprayer, which uses 10-20 gallons per acre. Over a year, assuming we hit our 10,000-acre goal, we would use between 20,000 and 30,000 gallons of water compared to a ground sprayer that would be using anywhere from 100,000 to 200,000 gallons of water to cover the same number of acres. Throughout this 5-year program, we would use less than or equal to a year of what a ground sprayer would require. Another consideration is the producers that are using chemigation as a way to apply their fungicides and insecticides to their crops. The typical chemigation application with a fungicide and irrigation water is 1/10th of an inch of water per acre. This equates to roughly 2,750 gallons of water per acre used to apply the fungicide. Using a drone, we use only two gallons of water per acre to apply fungicide. The goal of using cover crops in our operation is to preserve groundwater quality through the nutrient recycling process of cover crops. Continued use of cover crops has increased water infiltration rates due to increased pore space and soil health.