

**SUSTAINABILITY AND TRACKING STRATEGIES FOR GILLS ONIONS' FARMING OPERATIONS**

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**Project Overview**

Farming in California has many significant environmental impacts. Agriculture uses approximately 80% of California's applied water and is the state's leading contributor of nonpoint source water pollution. Agriculture is also a significant source of greenhouse gas emissions. These occur both on the farm and in the production of petroleum based agrochemicals used by growers.

Gills Onions, the largest onion processing company in the United States, has been nationally recognized for the energy and waste strategies at its processing plant in Oxnard, California. Knowing that you can't manage what you don't measure, Gills Onions came to us with the goal of improving the sustainability tracking of its agricultural supply chain. In partnership with Gills Onions and its contracted growers, we assessed the resources used and waste generated at three growing regions in California and a bulb propagation farm in Indiana.

**Project Objectives**

- 1. Assess the value of sustainability tracking for Gills Onions.**
- 2. Establish a baseline of resource use and waste generation for the 2009 growing season.**
- 3. Establish a data tracking framework in order to ease the tracking process in the future.**

**Objective 1: The Value of Sustainability Tracking**

Gills Onions will benefit from sustainability tracking in the following ways:

**1A. Staying at the forefront of industry trends**

The food and beverage industry is moving toward an increased emphasis on sustainability tracking and transparency. Companies such as Sysco, WalMart, and Unilever have made formal commitments to improving the environmental performance of their supply chains. They are looking for transparency and sustainability from their suppliers in the areas of waste, pollution, greenhouse gas emissions and water consumption. As onion buyers begin to demand a more sustainable product, Gills Onions will have a competitive advantage if it has an established sustainability tracking procedure in place and detailed records of resource use.



Figure 1: Map of Gills Onions Growing Regions



**1B. Staying ahead of environmental regulations**

New regulations are anticipated from the Air Quality Control Board and the Regional Water Quality Control Boards that will likely mandate additional monitoring and reporting of on-farm resource use. By establishing a culture of resource tracking now, Gills Onions growers will be prepared to provide additional information to government agencies as it becomes mandatory. Additionally, having detailed records of their resource use may enable growers to better inform future regulatory decisions.

**1C. Reducing input costs**

Thorough resource tracking may allow growers to identify areas for potential cost savings. We have identified the forecasted trends for diesel and electricity prices in California. These resources are expected to become more expensive as oil prices go up and water demands rise in the state. Figure 2 shows the USDA’s forecasted price increases for fertilizer and fuel over the next decade. Tracking will become increasingly important as the cost of farm inputs rises in the future.

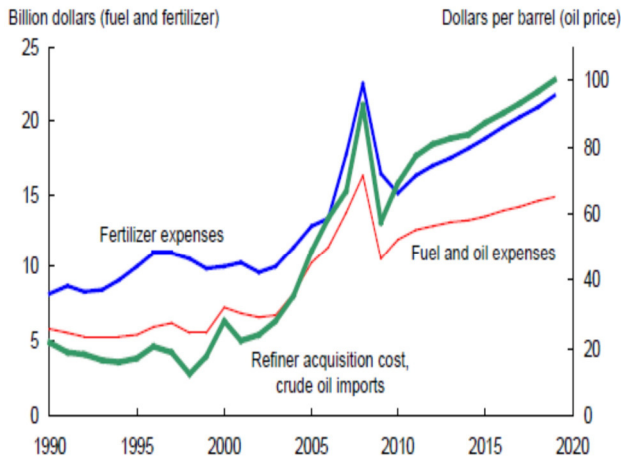


Figure 2: Current trends in oil prices and fertilizer and fuel inputs<sup>1</sup>

<sup>1</sup> Figure 2 is from “USDA Agricultural Projections to 2019” (USDA 2010)

**Objective 2: Resource Use and Waste Generation Baseline**

We collected data on the five major inputs to the growing operations: water, electricity, fuel, pesticides and fertilizer, and the two major outputs: waste and saleable onions. We aggregated the data and determined baseline values for farming inputs on a per-acre and per-ton of onions basis for Gills Onions’ 2009 onion crop.

**Farm Input Baseline Categories:**



**Stewardship Index for Specialty Crops**

As a methodological guideline, we relied on the metrics developed by the Stewardship Index for Specialty Crops, a multi-stakeholder initiative working to develop sustainability reporting metrics for the agricultural industry.

**Method:**

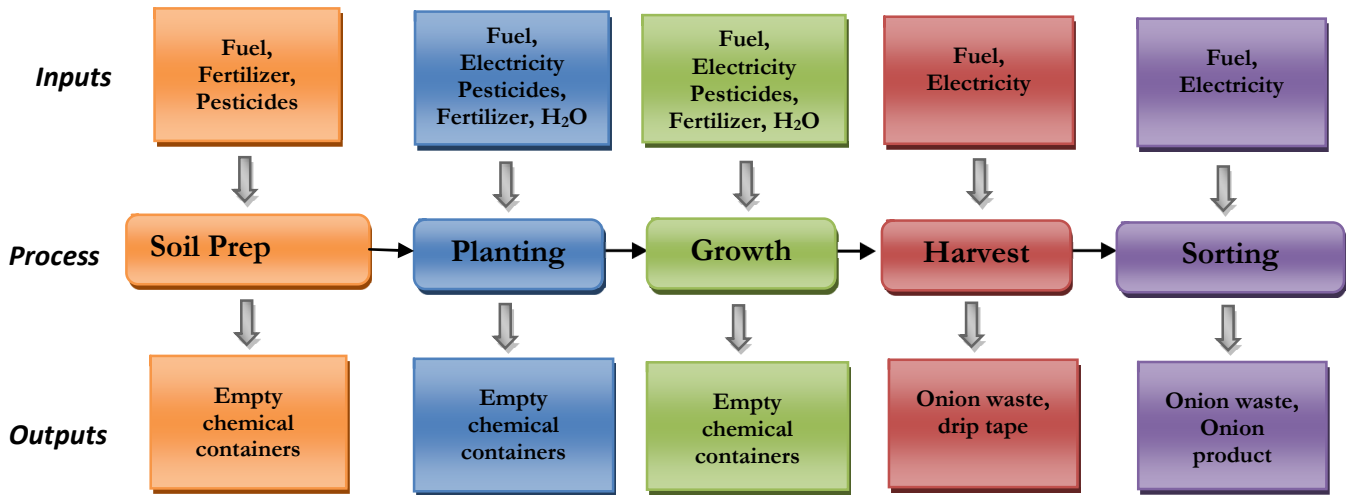
We collected data on a representative number of sample lots in each region and extrapolated to the full farm level. Sample lot information is shown in Figure 3, and the scope of the study processes is shown in Figure 4.

Region	Number of study lots	Acres in region	Acres in study	% sampled (study/total acreage)
Indiana	1	13	13	100%
Imperial County	8	423	132.5	31%
Monterey County	4	1504	49.3	3%
Fresno County	9	805	164.5	20%

Figure 3: Study lot acreage



Figure 4: Farm processes and corresponding inputs and outputs incorporated into baseline calculations



**Objective 3: Establish a Data Tracking Framework**

Our data collection process highlights areas currently not tracked at the level required for sustainability reporting. Therefore, we developed:

1. A Microsoft Access database to store farm data. The database is tailored to match practices particular to each growing region and provide the information we expect will be demanded of the industry in the future.
2. Documentation regarding the types of records kept in each region (e.g. utility bills, field sheets, etc.)
3. A prioritized list of recommendations for improving the quality and ease of resource tracking in the future.

**Carbon Footprint: Implications of Analysis**

**Monterey Region Carbon Footprint: 103 Kg CO<sub>2</sub>e/tonne onions**

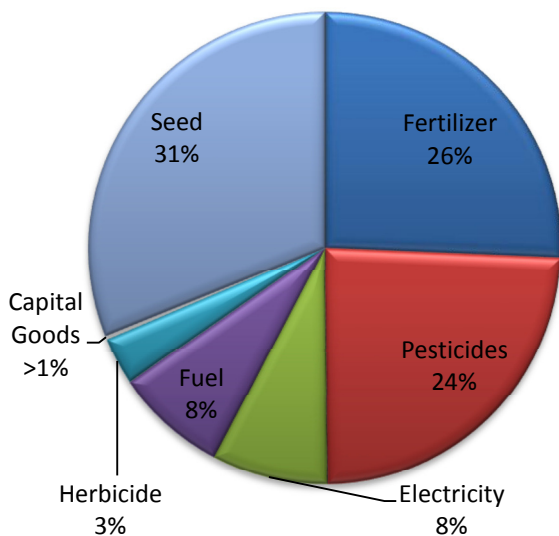


Figure 5

To show one way in which this data can be used, we performed a Carbon Footprint analysis. The data for the Monterey County Region was the most complete of the four regions, so we focused on this region only.

**Results:**

- We estimated the number one source of emissions to be the purchase of onion seeds. This is a surprising finding, but not counterintuitive when you consider that the production of onion seeds is, in essence, an entire onion growing operation.
- The second and third most significant emissions sources were fertilizer and pesticides. The emissions are released in the production of these chemicals. Nitrous oxide is also emitted from fertilizer after it is applied to fields. Nitrous oxide is a potent greenhouse gas with a global warming potential 298 times that of CO<sub>2</sub>, meaning even small amounts are impactful.
- Fuel and electricity had a relatively small overall contribution, with the fourth and fifth largest emissions.



**Challenges to Sustainability Tracking**

**1. Time Investment**

Sustainability tracking and reporting may require significant time investments and procedural modifications by farm staff. For example, tracking fuel consumption will require a new data tracking method since machinery operators will have to record fuel measurements regularly.

**2. Capital Investment**

Increasing sustainability may also require capital investments in new equipment or more resource efficient technology. For example, installing water meters will require an up-front investment by growers.

**3. Differing incentives throughout the supply chain**

An additional challenge is that the growers contracted with Gills Onions may have other priorities that compete with the recording and reporting of resource use information. Sustainability tracking may benefit Gills Onions by making their products more competitive against other processors. The growers may only see increased profits if sustainability reduces the cost of their operations or increases market opportunities and sales prices.

**Tracking Priorities**

Because of these challenges, we suggest that Gills Onions prioritize data collection and tracking of resources in the following order: fertilizer, water, energy, waste, and pesticide. This prioritization accounts for the current level of data collection, ease of data improvement, and potential for reduction in environmental impacts.

Tracking Priority	Suggested tracking levels	Reason for prioritization level
Fertilizer	Sample lots	Upcoming regulations may require tracking. Fertilizers are major contributor to both carbon footprint and hazardous waste generation.
Water	Sample lots	Relatively easy for Imperial and Fresno to track given their current systems. Monterey growers will have to install water meters on select fields.
Energy	Sample lots	Complex resource area due to multiple fuel types, machinery sharing between different fields, and staff time requirements.
Waste	All acres	Gills already knows pre- and post-grading onion waste, making it easy to track. Gills may have little influence on how agrochemicals are packaged.
Pesticide	All acres	Already tracking due to state regulations. Pesticides are major contributor to both carbon footprint and hazardous waste generation.

**Conclusion**

We believe that farm level data tracking will allow Gills Onions to better understand its environmental impacts and respond to buyer demand for transparent and sustainable growing operations. Careful data tracking will allow Gills and its growers to identify areas for environmental improvement and cost savings. This will provide Gills Onions with the tools it needs to continue to be a leader in the world of sustainable agriculture.