Sustainability and Tracking Strategies for Gills Onions Farming Operations

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Modern agricultural production is heavily dependent on inputs such as energy, water and agrochemicals, all of which have significant environmental impacts. In order to understand and reduce these impacts, a variety of organizations, businesses and growers are beginning to implement sustainability tracking programs. With this in mind, we set out to answer the question:

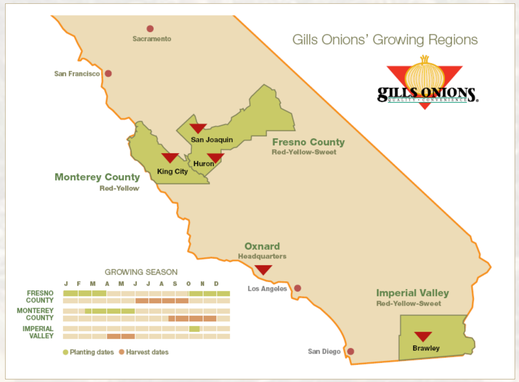
What does it take to grow an acre of onions?

Background

Gills Onions, the largest onion processing company in the country, came to the Bren School with a goal of understanding the environmental impact of their growing operations. The company is widely recognized as a sustainability leader in the food processing industry for efficiency innovations at their processing plant in Oxnard, CA. By expanding the company's environmental assessment to the farm level, our project will allow Gills Onions to complete their sustainability story, from planting to finished product.

Growing Regions

In order to secure a year round supply of onions, Gills Onions grows in three regions in California: Imperial, Fresno and Monterey counties. In addition, they rely on an onion bulb propagation facility in Indiana to provide onion starts for a portion of the crop in Imperial County. Each of the growing regions has different soils, climate and pests, making farming strategies diverse.



Why Track Resource Use?

Industry Demand

Corporations in all sectors of the food and beverage industry are starting to implement program that measure and report the sustainability of their supply chain. As more companies adopt these standards, resource tracking will be critically important for businesses to stay competitive in the produce marketplace.

Upcoming Environmental Regulations

New air and water quality regulations such as the agricultural waiver by the Regional Water Quality Control Boards are currently in development and will likely call for additional monitoring and reporting by growers. Implementing a tracking system now will facilitate future regulatory compliance.

Savings for Farmers

The price of inputs such as diesel, electricity and water are forecasted to rise in coming years. Tracking resource use and cost will allow growers to compare their practices from year to year and identify areas for cost savings.

Resource Tracking Strategy

To establish a resource tracking strategy for Gills Onions we:

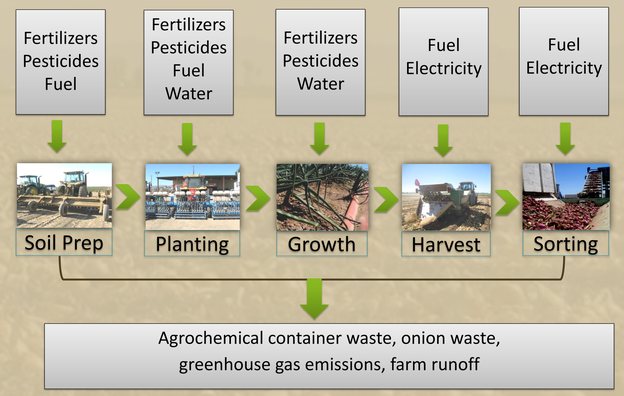
1. Determined the main resource inputs used in growing operations. The flow chart to the right displays the main farming processes and corresponding resource inputs and outputs. For our study we focused on water, fertilizer, pesticides, energy and waste.

2. Visited the growing regions and interviewed the growers to understand onion production and identify the current record keeping methods that are used to track on-farm resource use.

3. Selected study lots and gathered data from bills, invoices, field records and grower estimates to calculate a baseline of resource use for the 2009 onion growing season.

4. Created a custom database to house the data in the future.

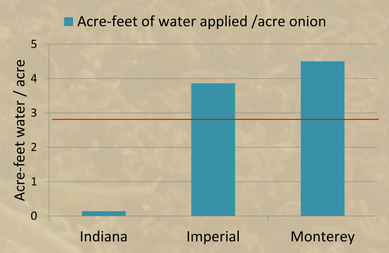
5. Provided recommendations on how to better track resource use in the future



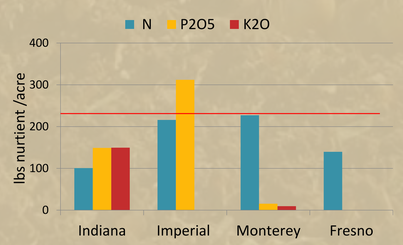
Baseline Resource Use for the 2009 Onion Crop

Red lines depict averages for California

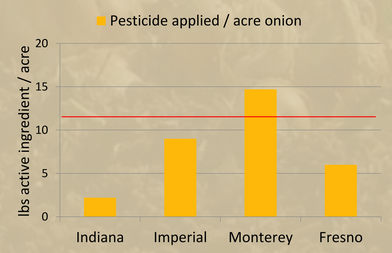
Water



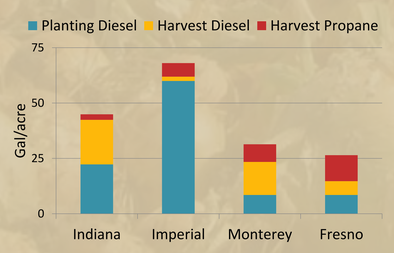
Fertilizers



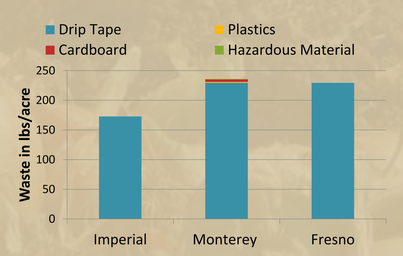
Pesticides



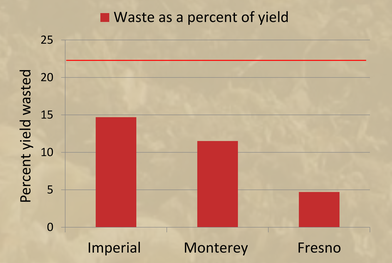
Energy



Physical Waste



Onion Waste



References

Water: suggested application rate 2.75 acre-feet per acre. Source: Voss, R.E., K.S. Mayberry (1999). Fresh *Market Bulb Onion Production in California*. Vegetable Research and Information Center. University of California Divison of Agriculture and Natural Resources. Publication 7242.

Fertilizer: In 2002 the California average of 213 lbs N/acre, 221 lbs P2O5/acre and 81 lbs K2O/acre. Source: Economic Research Service, (2002). *Onion Statistics (94013)*. Table 61 Onions, dry: Fertilizer use by State, percent of acres treated and total amount applied, 2002.

Pesticide: In 2008 the California average of 11 lbs Active Ingredient/acre was applied to onion fields. Source: California Department of Pesticide Regulation, (2010). *Pesticide Use Reporting*.

Waste: On farm agricultural waste is estimated at 20-25%. Source: Jones, T. (2004) *What a waste!* Interview: The Science Show, 4 December.

Resource Tracking Challenges

1. **Missing data:** Resources were not tracked or records were discarded at the end of the year.
2. **Allocation problems:** Water distributed to multiple crops at a time, tractors used on multiple fields.
3. **Lack of data control :** Processes controlled by a third party, (e.g. pesticide applicators) making it difficult to acquire data records.

Deliverables

Future Data Collection Strategies:

- Water: Establish study ranches and install water meters
- Fertilizer: Combine multiple field data sheets into one that tracks water and fertilizer applications
- Fuel: Record total fuel purchased and used for planting and harvesting. For mid-season work, select study ranch and calculate fuel use based on equipment specifications in database.
- Electricity: Install process-specific electric meters at the sorting and grading facility.

Database Solution:

We created a Microsoft Access database customized for Gills and their growers. Users can input data at ranch or lot level, it has detailed product information on the fertilizers and pesticides currently used and also has equipment specifications. With all data stored in one location, Gills will be able to efficiently track and report their resource use and compare performance year to year.

Participate in Sustainability Reporting:

The baseline results were submitted as a pilot project for the Stewardship Index for Specialty Crops. This consortium of diverse stakeholders is currently working to develop national metrics to measure sustainability in conventional agriculture.

Empower Gills to Improve Environmental Performance:

Armed with a process to collect and store data, Gills can now assess areas where the company would like to reduce their environmental impacts. To demonstrate the usefulness of data, we used the baseline to calculate a carbon footprint for the Monterey County region. The analysis highlighted hot spots of high greenhouse gas emissions and will help Gills prioritize areas for improvement.

Acknowledgements

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