Stewardship Leaders in Agriculture

Environmental Leadership with Nutrient Management

American Farmland Trust
Saving the Land that Sustains Us

Dairy Central

Bob Borba is the owner of Dairy Central which is located west of Hilmar, CA in unincorporated Merced County. The dairy recently underwent expansion and now houses approximately 1,500 animals on a 510 acre site. Mr. Borba's expanded diary has set the bar extremely high with its comprehensive consideration of all possible environmental impacts and its associated nutrient management company, Perfection Injection.

A Next Generation Dairy

In 2010, Mr. Borba completed a comprehensive renovation of his dairy operation such that it now meets and even exceeds all environmental regulation and shows the potential for the diary industry to be stewards of our natural resources. The state-of-the-art dairy underwent review through the California Environmental Quality Act (CEQA), a comprehensive environmental law, culminating in a thorough Environmental Impact Report that analyzed all environmental aspects of the dairy and includes detailed engineering and management plans to minimize impacts to local air and water quality. An example of the forward thinking practices employed on the dairy is the water management system that recycles the same water multiple times before finally flushing the lanes.Mr. Borba is further leading the way with his drag hose nutrient management company, Perfection Injection, which seeks to replace surface application of manure with below ground injection that is better for the soil, uses less water, and has a smaller environmental impact.

"Drag hose injection greatly improved my ability to manage the ponds at my dairy. We were able to clean the ponds out more efficiently and apply the nutrients evenly over our cropland. … Once we added direct drag-hose injection to our irrigation practices, we saw a greater increase in our crop yield and greatly improved health of our soil." – Dave Godinho

ACHIEVEMENTS

- Dairy Central successfully underwent comprehensive environmental review as required by the California Environmental Quality Act
- Founded Perfection Injection, a manure injection company in 2010
- Manure Injection reduces air pollution and odors as much as 90% compared to surface application
- Manure Injection has proven to be an effective way to reduce greenhouse gas emissions and gaseous ammonia emissions

"We have noticed that we are more accurate than tank application of the manure, we are cleaner and we are definitely Natural Resource Conservation Service compliant. Every producer that we do work for praises the idea that we are quiet, we are not creating excessive dust in transporting the material, there is no soil compaction, and we evenly distribute the nutrients with flow meters and gps."
- Bob Borda, Dairy Farmer

PROJECT PARTNERS

Environmental Planning Partners

Hydro Engineering, Inc.

Jag Pumps & application equipment

Natural Resource Conservation Service

San Joaquin Valley Air Pollution Control District

R & J Avila Inc.

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Hydro Engineering, Inc.

Manure injection requires large and expensive specialty equipment. When Mr. Borba looked to outfit his manure injection company, Perfection Injection, he turned to Hydro Engineering, Inc. Hydro Engineering's founder, Tom Hoffman, invented the drag hose concept used to transfer the manure from the storage ponds to the fields. With Mr. Hoffman's 20 years of experience, Perfection Injection is well positioned to provide its environmentally minded services to California's Central Valley.

MANURE INJECTION PROJECT DETAILS

PROBLEMS WITH SURFACE APPLICATION OF MANURE

During the recent economic downturn Mr. Borba was faced with the expensive practice of using hired tanker trucks to surface apply manure to his fields as is traditionally done. This practice was not only expensive, but also fraught with other problems. The heavy tanker trucks compact the soil, kick up considerable dust, and have a large carbon footprint. The application of the manure lacks precision and can lead to an over application of manure that has the potential to leach nutrients form the soil. An under application of manure is likewise possible and forces the farmer then to purchase expensive commercial fertilizer to compensate. Furthermore, the surface application has a large odor associated with it that Mr. Borba's neighbors had complained of. In Mr. Borba's own experiment, he found that manure left on the surface of a field lost 70% of it ammonia to the air after only a few days, an expensive loss when each tanker load cost $110. Faced with this situation Mr. Borba began investigating manure injection and found no reason that Northern California dairies between Fresno and Sacramento would not be interested in injection as opposed surface application of their manure.

"PERFEECTION INJECTION" MANURE INJECTION

After consulting with Alvin Azevedo, another Central Valley forward thinking dairy man, talking with Tom Hoffman owner of Hydro Engineering and inventor of the drag hose used in the manure injection operation, and mentoring from John George, owner of Jag Pumps and Application equipment, a custom manure injection company in Iowa, Mr. Borba formed Perfection Injection. Perfection Injection places a pump in the manure pit and pumps the manure slurry through a six-inch hose to fields two or more miles away. The hose is connected to a tractor in the field that uses a 24-foot injector bar to inject the manure eight inches into the soil. Application rate can be changed on the fly by adjusting the speed of the tractor, and onboard GPS and nitrogen testing equipment allows for highly accurate application of precise amounts of manure.

MEASURING SUCCESS

Borba has found both agronomical and manure management benefits from using manure injection as opposed to surface application. Farmers see a better nutrient uptake from their organic fertilization than with surface spray and flood irrigation. Farmers also are better able to manage their storage capacity and to balance their application with the amount of manure slurry they have in storage. Manure injection is more accurate, cleaner, does no compact the soil, releases less pollution, and is Natural Resource Conservation Service compliant. With direct injection of ammonia into the soil, Mr. Borba has been able to increase the organic matter in his soil from 1.6% to 2.5%, which allows beneficial microbes to work better and improves the soil and plant health. Less commercial fertilizer is needed and there is a reduction in the risk of polluting local waterways or groundwater.

For more information please contact:

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