

Extension expands agricultural use of dairy compost to manage soils sustainability

The Situation

Both conventional and organic growers in southern Idaho are actively pursuing affordable soil additives to replace or reduce commercial fertilizer use. With Idaho being the third largest dairy producing state, dairy compost could possibly be an economically viable nutrient source. A major goal would be to redistribute dairy waste throughout south-central Idaho, alleviating possible nutrient build-up near the concentrated Magic Valley dairy industry. Producers need more research based information in order to encourage dairy compost use. Research is needed to understand the process of mineralization of dairy compost in high-desert, dryland growing conditions to help growers match nutrient release to crop nutrient demand. In addition, more information is needed on the nutrient economic value of dairy compost.

Our Response

With a 4-year on-farm research trial, University of Idaho Extension Educators and a Soils Specialist tested different application rates of dairy compost applied each fall on organic dryland alfalfa and barley rotational crop systems. Researchers conducted a variety of soil tests to address the following grower questions:

1. Following a fall application, when in the growing season are compost nutrients released and made plant available?
2. With the cost of hauling and spreading compost, how often should a grower apply compost and at what rate?
3. Is dairy compost economically viable for maintaining or increasing soil fertility and crop yields?



Spreading dairy compost over fall dormant alfalfa field.

UI Extension responded to these important producer questions by sharing research results at over 20 local and regional producer workshops and conferences from 2010-2013. Results from these trials allowed Extension professionals to provide recommendations on best management practices for compost use.

Program Outcomes

On-farm research helped producers answer how best to use dairy compost in their dryland cropping systems.

- With a fall application under southern Idaho growing conditions, phosphorous and potassium from dairy compost was immediately available to plants in the spring, while nitrogen was not available until the second year following the initial compost application.
- Research results indicate that an application rate of 5-10 tons/acre every year is optimal for alfalfa and

barley rotational systems. Applying 10 tons/acre every other year saves on hauling costs.

- Nutrients from dairy compost are economically competitive and have a greater long-term benefit to soil fertility compared to synthetic fertilizers. Dairy compost is economically viable for maintaining crop yields and managing soils for short-term nutrients and long-term increased organic matter.

Ninety percent of producers plan to implement dairy compost into their soil management plan or adjust their current use of dairy compost, according to two surveys conducted at multi-county Sustainable Soil and Cereal Schools (75% survey return rate). Over the three years of presenting research results, it is estimated that UI Extension Educators and Specialist reached over 700 producers in a 440,000-acre area planted in barley and alfalfa. The information provided helped growers more confidently adopt a sustainable soil management practice that helps to redistribute dairy waste nutrients away from the concentrated Magic Valley dairy industry. In the state of Idaho, the estimated value of alfalfa production is \$958 million and barley production is valued at \$267 million (ISDA, 2012). The use of dairy compost will help producers improve soil fertility, reduce fertilizer expenses, and practice an environmentally sustainable redistribution of dairy waste nutrients.

FOR MORE INFORMATION

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