

# IMPACT



University of Idaho  
Cooperative  
Extension System

---

Elmore County, 150 S 4<sup>th</sup> East, Suite 1, Mountain Home, Idaho 83647 (208) 587-2136 Fax (208) 587-2159

---

## Organic Potatoes Thrive on Composted Manure

### *The Situation*

Organic production, the production of a crop without pesticides or chemically synthesized fertilizers, is potentially a very profitable agricultural enterprise. Demand for organic produce is expected to increase as people in an increasingly urban society become concerned about food quality. Prices for certified organic produce may be considerably higher than conventionally produced crops. However, crop management options are extremely limited in an organic system, often leading to reduced yields. Nitrogen supply is often a limiting factor in organic production since nitrogen cannot be applied as a synthetically produced material as in conventional agriculture. In conventional agriculture, nitrogen management is accomplished by applying inorganic nitrogen sources. These fertilizers are composed of relatively simple molecules that provide nitrate, the form of nitrogen that is most easily taken up by plant roots. Some materials provide nitrate



directly while others are transformed to nitrate via a short sequence of reactions in the soil solution. Thus, nitrogen management is relatively simple and straight forward in a conventional cropping system. In organic agriculture, nitrogen management is accomplished by applying organic materials such as compost. Organic nitrogen is locked up in organic molecules and cannot be utilized by plants until it is converted to inorganic nitrogen through a complex series of biochemical reactions known as mineralization. On the positive side, organic sources provide a reservoir of nitrogen that is released slowly by the organisms of the soil foodweb. However, nitrogen management is more complicated because nitrogen cannot be readily applied throughout the season. Crop management in organic cropping systems can be improved through better understanding of crop response to compost and the dynamics of mineralization. Because of differences in how synthetic and organic nitrogen is made

(Continued on back)

*College of Agriculture*

---

The University of Idaho is an equal opportunity/affirmative action employer and educational institution.  
University of Idaho, U.S. Department of Agriculture, and Idaho counties cooperating

available to the plant, supplying the needed nitrogen in an available form at the proper time is challenging.

## ***The Response***

The Elmore County Extension Educator has conducted trials of composted manure as an alternative fertilizer source in organic potato production. Composted manure was applied at several rates to small plots in an organic potato field near Hammett, Idaho. All management practices, except the treatments, were the same as in the rest of the field. The objectives of this trial were to determine the yield response of potatoes to composted manure and estimate nitrogen mineralization under an organic system. Yield was determined at harvest and nitrogen mineralization was determined by the buried bag method.

## ***Achievements***

The trials are quantifying the response of organically produced potatoes to applications of composted manure. This accomplishes two beneficial effects. First, providing an organic source of nitrogen for organic potato production, and second, providing a use for the primary waste product of the dairy industry. These trials have been shown at field days for organic producers and people with an interest in organic production. Grower response has been favorable. Because of this work, several growers have started using compost as part of a crop management system. Organic growers are using it as a primary source of nutrients while conventional growers are using it as a supplement to inorganic fertilizers. This improves the profitability of farming enterprises and benefits the environment by providing a

slow release form of nutrients. A healthier soil ecosystem has more efficient nutrient cycling such that nutrients are retained in the organic pool and released slowly to the crop rather than being subject to leaching into groundwater.

## ***The Future***

We have shown that compost is a useful addition to crop management in organic and conventional cropping systems. Further trials will be conducted to investigate the agronomic benefits of compost and devise improved methods to manage its use within cropping systems.

Mineralization studies will be done using the buried bag method to determine the optimum amount and timing of nitrogen release in soils treated with compost. Studies will be done to determine pest management benefits of compost. Recent research has shown that a healthy soil ecosystem produces an abundance of beneficial soil organisms that are antagonistic to pathogenic organisms.

## ***For More Information***

Mir Seyedbagheri, Extension Educator  
University of Idaho  
Elmore County Cooperative Extension  
150 S 4<sup>th</sup> East, Suite 1  
Mountain Home, Idaho 83647  
Phone: 208-587-2136, Fax: 208-587-2159  
E-Mail: [elmore@uidaho.edu](mailto:elmore@uidaho.edu)



The University of Idaho is an equal opportunity/affirmative action employer and educational institution.  
University of Idaho, U.S. Department of Agriculture, and Idaho counties cooperating