ALFALFA FERTILITY AND COMPOST MANAGEMENT

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RATIONALE

Alfalfa hay generally constitutes 40% of the ration of Idaho's dairy cows. Alfalfa yield and quality may be affected positively or negatively by compost from dairy manure.

Compost is an environmentally-friendly byproduct of the dairy industry. It is logical to return unused nutrients from a dairy to the alfalfa fields which exported them rather than to use only commercial fertilizer to maintain the nutrient balance. Alfalfa yield may be better maintained by applying compost to replace nutrients (N, P, and K) exported from fields by forage harvesting. A study was done near Kimberly to 1) determine effects of applied compost on alfalfa yield in southern Idaho and characterize the forage quality; and 2) develop or refine alfalfa fertility guides to plan for more sustainable agronomic practices of alfalfa production and to solve nutrient cycling problems from dairy manure.

PREVIOUS WORK

A search of the *Agricola* database for "compost and alfalfa" produces 11 records including studies from Egypt and China, but none of the abstracts of the studies reported on the forage quality of alfalfa as affected by compost. Hansen-Sissel (1996) reported that increasing the com

Table 2. Effect of compost and fertilizer treatment on alfalfa forage quality on 3 cuttings in 2003 at Kimberly, Idaho.

		First Cutting June 22			Second Cutting August 4			Third Cutting October 4		
Entry		CP (%)	ADF (%)	RFV	CP (%)	ADF (%)	RFV	CP (%)	ADF (%)	RFV
C	2	19.7	32.4	148	21.7	28.1				

RECOMMENDATIONS

Soil Test for Alfalfa Fertility

The first step in fertility management for alfalfa is to adequately sample the soil in a field prior to planting. It is important to soil test prior to planting so that nutrients from fertilizer, compost, or manure can be incorporated into the soil prior to alfalfa establishment. The following gives guidelines for alfalfa fertility:

Soil samples should at least represent the top 12 in. of soil because alfalfa obtains > 70% of its nutrition from the top 2 feet of soil depth. The soil should also be sampled from 1 to 2 feet of depth periodically. If soil tests indicate fertilizer is needed, apply and work the fertilizer 4-6 in. into the surface when preparing the seed bed. Alfalfa will respond to P, K, S, Zn, and B when these nutrients are deficient. Most likely, phosphorus will be the nutrient most needed. Use your soil test information to consult the Southern Idaho Fertilizer Guide: Irrigated Alfalfa (CIS 1102) http://info.ag.uidaho.edu:591/catalog/fertilizers.html for recommended application of nutrients from compost or fertilizer.

Compost or Manure Application on Alfalfa

Compost can be applied pre-plant or annually in the fall. The application rate should be based on a soil test and fertilizer guidelines. Alfalfa will recycle nutrients and can use up to