CALIFORNIA STATE SCIENCE FAIR
2015 PROJECT SUMMARY

Name(s)

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Project Number

35360

Project Title

Can Fertilizer Effectiveness Be Maintained while Controlling Pollution from Chicken Manure?

Abstract

Objectives/Goals

The objective of this study is to identify a reliable and cost effective solution which will reduce pollution from chicken manure while maintaining the manure#s effectiveness as a fertilizer.

Methods/Materials

Study includes 2 test models:

Manure Analysis includes

3 independent variables and a control. Test subjects are 8 adult Rhode Island Red layer chickens in test groups of 4 subjects divided into 2 cages. The feed modification and manure amendment will consist of a 3% protease enzyme ratio to 100g of 5600 layer feed and 3% amendment of wood ash applied to ½ of each test manure group collected. 1qt of each variable will be transported to Dellavalle Labs for chemical analysis. A LECO machine will be used for nitrogen testing and an ICP for potassium and phosphate testing. Both the LECO samples and the ICP samples will be dried and ground before testing. ICP samples will go through series of digestion before testing.

Seed Germination and Plant Growth

Plants will be arranged into 5 groups of 10 per soil amendment. The soil will be Jiffy: Natural and Organic Seed Starting Mix. Each will be mixed with, at a 20% ratio of manure to soil: Non-modified feed produced manure (MFPM), non-MFPM with wood ash amendment, protease enzyme MFPM, and protease enzyme MFPM with wood ash amendment. Every three days the plants will be measured using height and width.

Results

Manure Analysis

Non MFPM; N: 13.2 lbs./ton, K2O: 16.4 lbs./ton, P2O5: 23 lbs./ton. Non MFPM with wood ash; N: 17.8 lbs./ton, K2O: 15.4 lbs./ton, P2O5: 21.6 lbs./ton. Protease enzyme MFPM; N: 18.4 lbs./ton K2O: 14.2 lbs./ton, P2O5: 19.8 lbs./ton. Protease Enzyme MFPM with wood ash; N: 18.2 lbs./ton, K2O: 15.4 lbs./ton, P2O5: 21.6 lbs./ton.

Seed Germination and Plant Growth

Control: 55.18 cm average. Non MFPM: 38.20 cm average. Non MFPM with wood ash: 37.10 cm average. Protease enzyme MFPM: 44.68 cm average. Protease enzyme MFPM with wood ash: 24.47 cm average.

Conclusions/Discussion

This study does indicate that nitrogen levels can be maintained while potassium and phosphate levels are

Summary Statement

Can chicken feed modification combined with manure amendments reduce pollution while maintaining fertilizer effectiveness?

Help Received

Scott Fridlund, Laboratory Director of Dellavalle Labs

Preliminary