THE EFFECT OF PIG MANURE ON SWEET POTATO YIELDS

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INTRODUCTION

Experiments have shown that using artificial fertilizers on sweet potato can be profitable.

Another source of crop nutrition could be pig dung. As more pig projects develop, this will become easy to obtain and cheap. It could help increase yields of sweet potato in the short term. At the same time, using pig dung over a long period of time would also be expected to gradually improve the soil.

In many systems of mixed farming involving pigs, a mixture of pig dung and urine, with water added, is returned to the field. The use of both pig dung and urine is rare in Papua New Guinea. However, if the idea is accepted by farmers, it would probably involve using pig dung only at first. To use the urine as well involves extra expense in making a method of collecting it.

Wet pig dung smells very strong. When it is left in a heap, it becomes very hot. Because of this, it could possibly damage a sweet potato crop if it is put on directly from the piggery.

This article describes an experiment to find out whether wet pig dung could be used safely as a fertilizer for sweet potato.

METHOD

The experiment was carried out at the Tropical Pig Breeding and Research Centre at Goroka.

There were three treatments: no dung; 22 tonnes of dung/ha; 44 tonnes of dung/ha.

The dung was applied by spreading it as evenly as possible over each plot. It was mixed into the top 10-12 cm of soil using a spade, then the ridges were formed for planting. The dung was seen to be mixed evenly within the ridges.

Each treatment was applied to 12 different plots. Sweet potato was planted in May, and harvested in November. This is the usual dry season in Goroka.

The amounts of nitrogen, phosphorus and potassium in pig dung were not measured. Table 1 gives estimates of the amounts based on figures already published.

The information in this article was first presented at the Workshop on Waste Recycling Systems at the University of Papua New Guinea, July 1973.

TABLE 1. ESTIMATED AMOUNTS OF APPLIED N, K AND P (KG/HA)

Rate of dung applied (t/ha)	Nitrogen	Potassium	Phosphorus
22	100	60	60
44	200	120	120

Source: Muehling, A.J. (1969). *Swine Housing and Waste Management.* Dept. Agric. Eng. University of Illinois.

RESULTS

The yields of marketable tubers for each treatment were as follows:

Treatment	Yield (kg/ha)
No dung	13 400
22 tonnes/ha	17 000
44 tonnes/ha	15 900

DISCUSSION

There was an increase in yield after applying 22 tonnes of dung per ha. The increase after applying 44 tonnes of dung was smaller.

One possible reason for this is that the larger amount of dung may have been too moist and hot. More experiments are needed to find out whether rates of less than 22 t/ha would improve yields. However, it is clear that it is a good idea to use wet pig dung as a fertilizer for sweet potato, even in large quantities.

A lot of work is involved in applying the dung if hand tools are used. Some farmers may prefer to sun-dry the dung before using it. This makes it much lighter and therefore easier to carry.

An important question is: Can we apply the results of a single experiment with pig dung on sweet potato to other soils and other crops?

Trials with fertilizers on different crops and different soils have often shown yield increases. Pig dung contains nutrients (plant foods) which should be good for crops. Also, mixing organic matter (i.e. waste from plants or animals) with soil often improves soil structure.

So we could expect pig dung to be generally useful in gardens especially on soils which are not very fertile.

A basic factor in developing farming systems in Papua New Guinea is to make sure that productivity does not fall because of intensive cropping methods. There are already problems of land shortage in the highlands. We should be aiming at the conservation and improvement of the nutrients and the structure of the soil.

This experiment shows that pig dung can be a useful fertilizer for sweet potato. Small farmers should be encouraged to use it both for its short term and its long term benefits.

Editorial note

Further experiments have been done by Aiyura staff in the Southern Highlands Province. In these experiments pig dung also increased yields of sweet potato.

The recommended rate of application is 15 tonnes/ha (that is 1.5 kg/m^2).