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MANURE DISPOSAL FROM PIGGERIES

By P. McNAMARA, M.A. (Cantab.) Pig Husbandry Adviser

Many new piggeries have been built during the past year as more farmers swing over to intensive housing. In most cases the problem of effluent disposal has been overlooked. This article shows how some pig raisers are beating the problem.

Many new piggeries are now being built in Western Australia to house pigs under intensive conditions. Too often the piggeries are built without allowance being made for the disposal of affluent.

Plans must be made to deal with the large amounts of solids, urine and washing down water, which can amount to thousands of gallons per week. To hope that it can be run away down the paddock is optimistic; before long the new piggery will be a breeding ground for flies and a general health hazard.

Bedding is seldom used in these new piggeries, the pigs sleeping on an insulated floor, so the dung and urine in the passages is usually free from all bedding material.

Most of the methods of disposal described rely on water to remove this dung to tanks, and this in itself has several advantages:

- Gates need not be opened with fear of mixing pigs.
- Reduction in smell and flies.
- No film of muck on concrete.
- Easier working conditions.

The Septic Tank

If we are prepared to disregard the value of the manure entirely, either because of insufficient quantity to be of real use, or because labour demands elsewhere on the farm are great, the septic tank may be the solution.

The piggery is washed down, care being taken to see that there is no straw or bedding in the dung, and carried in a drain to the septic tank. From here bacterial action takes over and the breakdown process sets in.

At the Denmark Research Station a tank has been operating for two years quite successfully for the farrowing pens, and it is intended to build tanks for the fattening house also. Probably the septic tank has its main applications where the number of pigs kept is not too great, and the main object is disposal, rather than utilisation of the dung.

Details of the septic system at Denmark are published in the Journal of Agriculture of February, 1966.

Value of Pig Manure

The actual value of pig manure in terms of N.P.K., trace elements, etc., will differ widely according to the conditions under which it is produced. The quality of feed, the method of distribution, the time of year and many other factors will influence this, but there is a considerable benefit to be gained from its use as those who have used it will know.

To give some indication of its value it has been stated that 1,000 gallons of sludge on average will contain the equivalent manural value to:

- 2 cwt.—Sulphate of ammonia.
- 1 cwt.—Superphosphate.
- 3\(\frac{1}{3}\) cwt.—Muriate of potash.

210

Journal of Agriculture, Vol 7 No 5 1966
Top: Clean, contented pigs in the dung race of Graham Hill's piggery
Right: Graham gives the dung race its daily hose down

On average, one can expect 1 gallon of sludge per day per pig in a piggery, so the potential from a large number of pigs is considerable even if much of this manurial value is lost due to evaporation and other causes.

With this in view, the next two systems aim at utilisation of the dung, urine and washing down water.

The Sludge Tank
The size of this will depend upon the number of pigs kept, the amount of water used and the frequency of cleaning out. The two examples illustrate this point. As a rule of thumb, reckon on a gallon of dung and urine per day per pig housed. It will take from 2-4 gallons of water per pig housed for washing down, which means allowing 3-5 gallons per pig per day storage.

Spreading with a Tanker
This system is now used by Graham Hill and the photographs were taken at his property at Pingelly.

Specifications
Capacity of shed 16 pens—208 pigs.
Capacity of tank—2,000 gallons.
Water used per day—600-700 gallons.
Size of hose nozzle—⅜ in.
Pressure used for washing—30 G.P.M.
Sludge is pumped from an underground tank into the tanker-spreader. The sludge is pumped into the tanker. No straw or bedding is used in the pig pens.

Pump—3 in. Impeller.
Motor (electric)—6 H.P.
Time to fill tanker—4 mins.
Time to empty tanker—4 mins.

The tanker consists of a 500 gallon tank mounted on an old 3 ton truck. Sludge is released through pipes at rear.

Each day hosing down takes about 25 minutes, and every third day muck is carted a distance of up to half a mile. This takes 1½ hours to clear the tank.

The use of a tanker does enable distant parts of the farm to be treated, and in this case gravelly ridges low in fertility have been greatly improved.

**Rain gun**

If manure can be used adjacent to the piggery it is worthwhile considering the use of a rain gun. Various models are available with spreading areas from $\frac{1}{2}$ to 2 acres.

The photograph shows a rain gun working at the property of Mr. G. Butler, Byford.

The capacity of Mr. Butler's shed is 400 pigs. These are washed down daily, the cleanings going into an 8,000 gallon tank.

This is pumped out once per week.

- **Pump**—Special Stalker impeller pump.
- **Motor**—15 H.P. electric.
- **Pressure**—70-80 lb./sq. inch.
- **Rate**—6,000 gallons per hour.

**Lagoons or Ponding**

This method is closely allied to the septic tank, but whereas the septic tank relies on anaerobic bacteria only, the lagoon makes use of both aerobic and anaerobic organisms.

At present there are no lagoons for pig dung in use in Western Australia, although they are widely used for other purposes. In U.S.A., Britain and the Eastern States lagoons have been used successfully and
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The ideal depth for a lagoon seems to be 3-4 ft., allowing 15 sq. ft. of pond surface per pig. All the effluent from the piggery is passed into the lagoon, which, if working correctly, is claimed to be odourless and free from flies.

Once again a good supply of water is required, but the capital overheads are very low.

The Muck Spreader

In Europe manure has been spread on the land for generations and the carrying of farm yard manure to fields was all part of the rotation.

Hand spreading became too expensive, so the muck spreader was evolved. This handles all types of manure, but normally that containing a high straw content being from cattle and pig yards bedded with straw.

Prior to using a tanker Mr. Hill built a spreader of similar design to that which he had seen in the U.K.

Summary

All these systems involves a capital expenditure and the farmer must decide which suits his particular layout best.

If he feels that the value of the manure in terms of N.P.K. does not justify its utilisation, then he has a choice between the septic tank and ponding. On the other hand, should he feel that the manurial value justifies the expense of handling, he can cart to the paddock in liquid form in a tanker, or as solids in a spreader. In many cases the very nature of the ground throughout the year will determine whether this is practical or not.

A piggery centrally situated with suitable paddocks around it will enable a rain-gun to be used, and an abundant supply of irrigation water would be a useful adjunct.

Finally, a word of warning.

"Leprospirosis could be a danger to grazing stock, especially in wet conditions. It would be advisable to keep stock off treated land for at least a month after manuring.
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