

## LAND APPLICATION – Spreading recycled organics

Recycled organics (particularly animal manures) are valuable as fertilisers and soil conditioners when spread at suitable rates.

A large amount of the cost of applying recycled organics to land is the cost of spreading. Not only is cost an issue, there can be concerns about even distribution and compaction concerns from driving over paddocks loaded with tonnes of manure. These problems are all manageable and need to be considered before deciding to use recycled organics on your farm. The issues of concern will be different for grazing properties compared to cropping enterprises.

### Spreading rates

Working out the best rate of manure to apply per hectare is can be done by estimating crop demands for nutrients (see the fact sheet 'Land Application – How much manure should I apply'). However, knowing the best rate to apply and getting that amount onto the paddock requires correct calibration of the spreader. One way to check the calibration of your spreader is given in example 1 below.

#### **Example 1. Measuring your spreading rate**

1. Take several drop sheets (tarps or plastic at least 2m x 2m) and lay them down in the path of the spreader (some near the centre and some towards the outside). It is best to do 2 passes side by side because manure may be applied on the outside drop sheets from both passes.
2. Run the spreader past the drop sheets  
Place a 1m x 1m square (this can be made up with fencing wire) on the drop sheet collecting and weighing all the manure inside the square
3. Take the weight of manure per m<sup>2</sup> and multiply by 10,000 to get it into kg/ha.
4. Divide this number by 1000 to get tonnes per ha.

### Distribution

Poor distribution from spreaders can be a source of application inefficiency and irregular crop growth. Distribution can be affected by the consistency of the product, the type of spreader and the operator. Generally manure will spread better if it contains at least 30% moisture. This will also reduce dust during spreading. Spreading will also be affected by the particle size of the manure. Generally speaking, fresh manure is likely to have an irregular, lumpy consistency while older manure contains less lumps.

Screening manure will reduce the number of large particles (and rocks etc) and improve the spreading ability of the product. Composted product also has a more uniform particle size which aids spreading.

Distribution can also be affected by the spreader being used. For most spreaders, a minimum rate of about 3-5 t/ha is required to get an even spread, and this may be higher for some spreaders.

Operator efficiency will influence where manure is spread on the paddock and at what rate. This is especially relevant for spreaders where operation speed influences the rate applied. Ensuring that row spaces are even is important for covering the whole paddock evenly. This can be estimated by the operator or done with GPS is available.

### Compaction

Compaction is caused by the movement of large implements across paddocks, and is a greater concern on crop land than on grazing land. Compaction is greatest when soils are close to field capacity. Ideally, spreading would be carried out when the soil is quite dry. Compaction can be reduced on crop land if the spreader can be set up to run on controlled traffic lines. Also, spreading manure on a 3 to 5 year rotation and supplementing with inorganic fertiliser as required is one option for reducing compaction and saving costs.

### Timing

The timing of manure application is influenced by a number of factors including;

- Crop or pasture needs
- Field conditions (soil moisture)
- Timing of other management events (ploughing to incorporate manure)
- Wind conditions

It is generally recommended to apply manure 4-6 months prior to the crop establishment in order to allow time for nutrients to mineralise from the organic matter contained in the manure. This can also reduce the risk of nitrogen draw-down which may occur after fresh or stockpiled manure is applied. However, there is a risk that some of the

nitrogen in stockpiled manure will be lost if it is applied a long time prior to crop planting.

In grazing systems, manure application should be timed to supply nutrients when feed demand is highest. For example, to boost spring feed growth manure can be applied in early winter.

If possible, manure spreading should occur when field conditions are best for reducing compaction.

Spreading should be carried out in low wind conditions to ensure distribution efficiency and reduce any negative impacts on neighbours.

### **Social and environmental considerations**

Spreading can result in dust and odour being spread for considerable distances. If spreading is to take place close to neighbours or other receptors, it is recommended that this is done when conditions are most favourable, when wind is low and ideally on weekdays. If odour is a concern, informing neighbours that spreading is occurring may be a good idea. Generally odour will only be a problem for a one or two days after spreading depending on the weather conditions and the spreading rate.

Spreading also needs to take into account the risk of environmental harm. While there is no specific legislation controlling the spreading of manure, all people have an environmental duty of care under the Environmental Protection Act (1994). Manure should be contained on the intended area, and should not be carried out within 30 m of waterways or on steep slopes where erosion losses may occur. While a small amount of rain following application can be useful, it is not advisable to spread when heavy rain is predicted.

### **Cost**

The cost of spreading animal by-products can be as great as the cost of the product itself. This makes spreading costs critical to the cost-benefit analysis of using animal by-products. The main options for spreading are; owning a spreader, employing contractors to spread manure or using a co-operative approach to buy a spreader for use by members. Spreaders vary greatly in size, from 1 tonne capacity to over 20 tonnes capacity. The size will affect both the price of the unit and other issues such as compaction.

Spreaders may be three point linkage mounted, trailing or truck mounted depending on size and intended use. If manure needs to be carted as well as spread, a truck mounted model may be preferred; however these units are generally mounted to the truck chassis and are not easily removed. Some contractors use specialised 4wd trucks for manure spreading but these units are quite expensive.

Three point linkage spreaders are relatively small capacity, lower priced units for spreading small areas of land. They are not suitable for spreading large amounts of manure because of the amount of time spent loading and travelling from the spreading area to the stockpile.

Trailing units are probably the best option for the farmer or co-operative farmer group. Trailing units vary in size from less than 5 tonne to over 20 tonne capacity. A good quality 10t manure spreader is likely to cost \$35,000 or more. These can generally be used for spreading lime and fertilisers which may offset the cost to some degree.

As spreaders are used infrequently, they are a good item to be purchased by a farmer group for joint usage. This could allow several farmers to benefit from using manure while reducing the capital costs.



**Photo 1.** 9.5 tonne unibar spreader in use on the Darling Downs

Hiring contractors is another option to keep costs down when spreading is being done on a one off basis or on a small scale. Contractors may operate on an hourly rate or tonnes spread basis and costs vary. Larger jobs are likely to be done for a lower rate as expenses are reduced. Rates quoted by contractors contacted at the start of 2007 ranged from \$7/t + fuel for on farm spreading (stockpile to paddock) to \$13/t, which included transport of manure from a nearby off farm site.

### **Some other fact sheets in this series:**

*Typical composition – Layer hen manure*

*Typical composition – Feedlot manure*

*Typical composition – Piggery spent bedding*

*Application – How much should I apply?*

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