

## Management of a Plunge Cattle Dip

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### INTRODUCTION

The use of plunge dips provides the most effective method for controlling ticks in cattle. However, if plunge dips are not managed correctly, effectiveness is reduced.

#### Dips using higher than the necessary concentration of the chemical:

- Are uneconomical because they waste expensive chemical.
- Can cause death, particularly in young calves and weak animals.
- Can deposit residues of the chemical in the meat which could jeopardise our markets, particularly the export market.

#### Dips using lower than the necessary concentration of the chemical:

- Do not kill many ticks.
- Can cause expensive delays in trucking cattle because of the presence of ticks.

Incorrect dip strength can also cause resistance in ticks to the chemical.

### DETERMINING THE VOLUME OF A DIP

The first step in good management is to know the volume of liquid in your dip.

There are three methods for determining the volume of liquid a dip:

- Use a flow meter to measure the amount of water going into the dip. This is the best method and eliminates any guesswork. Water metres can be obtained from most plumbing outlets.
- Fill the dip from a tank of known capacity.
- Use the following formula:

**Volume = Average length x average width x depth**

For example:

$$\text{Average length} = \frac{10 \text{ m} + 5 \text{ m}}{2} = 7.5 \text{ m}$$

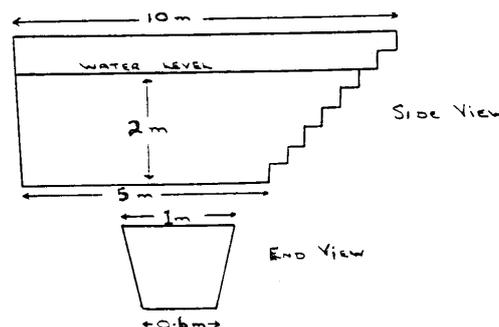
$$\text{Average width} = \frac{1 \text{ m} + 0.6 \text{ m}}{2} = 0.8 \text{ m}$$

$$\text{Depth} = 2 \text{ m}$$

$$\text{Capacity} = 7.5 \times 0.8 \times 2 = 12 \text{ cubic metres}$$

(1 cubic metre = 1,000 litres)

$$\text{Therefore volume} = 12 \times 1000 = 12\,000 \text{ litres}$$



Much time and effort can be saved by accurately marking the various volume levels on the dip wall, or on a measuring stick, such as at 5000 L, 6000 L, 7000 L and so on until the maximum level is reached.

## **ADDING THE CHEMICAL TO THE DIP**

Once the volume of the water in the dip has been calculated, the amount of chemical to be added should be accurately calculated according to the manufacturer's directions.

For example:

Volume of water in the dip	12 000 litres
Manufacturer's mixing rate	1:400
Amount of chemical needed =	$\frac{12\ 000}{400} = 30$ litres

**Therefore add 30 litres of the chemical to the water in the dip.**

DO NOT add a 'bit for luck', as this will increase the concentration of chemical in your dip.

## **TOPPING UP OR REPLENISHING THE DIP**

After the plunge dip has been used and the level of the mix in it drops, it becomes necessary to top it up with water and chemical.

The topping up rate varies with various chemicals and is always given by the manufacturer.

For example:

Volume of liquid lost from the dip	= 1500 litres
Top-up rate	= 1: 220
Amount of chemical needed	= $\frac{1500}{220} = 6.8$ litres

**Therefore top up the dip with 6.8 litres of chemical and 1,500 litres of water.**

If you are dipping a large number of cattle, top up the dip with water and chemical after every 400-500 animals have passed through in order to maintain maximum efficiency in your dip.

## **USE OF STIRRER CATTLE**

Before dipping, run at least 30 head of stirrer cattle through the dip to distribute the chemical evenly throughout the dip. These cattle should be returned to the main mob and dipped again. After any lengthy break in dipping (e.g. smoko break) stirrer cattle should be used again.

## **RECORDING DIP LEVEL**

On completion of dipping, note and record the level of liquid in the dip. Then at the next dipping, again note the level before commencing dipping. Calculate the difference in volume between the two levels. This can be done by using the levels marked on your dip wall or by using the above formula, with the depth being the difference between the two levels.

Variation in the levels between two dipping periods is mainly caused by:

### **Evaporation**

During hot weather water is lost from the dip by evaporation.

To correct this add only water to the dip until the level at the end of the previous dipping is reached. Note that if a leakage occurs, it will also cause a drop in the level; but in such a case, add both water and chemical using the above calculations.

### **Rain**

During the wet season rain water enters the dip causing the level of liquid to rise.

To compensate for this, chemical should be added at the initial charge rate for the excess amount of water deposited into the dip. If the dip overflows, it is best to carefully pump out the excess water from the top of the dip and top up with sufficient chemical to rectify the water-chemical ratio.

A roof over the dip will prevent rain water from entering the dip and will also reduce evaporation.

Do not forget to replenish the dip with chemical and water at the top-up rate before commencing the next dipping.

## **DRAINING PEN AND SUMP**

A concrete floored pen at the exit from the dip has the advantage of returning to the dip some of the wash removed by the cattle.

An area of 1.2 m per head of mature cattle should be allowed and the animals should be held in the pen long enough to allow all the excess fluid to drain from their coats.

The floor of the draining pen should be sloped back towards a sump.

Incorporating a sump in the design will help to remove the large dirt and hair particles from the wash before it returns to the dip. The sump should have two outlets which can be closed independently of each other.

One outlet returns the wash back into the dip and is kept open while the dip is in use; the other outlet allows rainwater to escape when the dip is idle. Always close the outlet back to the dip when dipping is finished.

## **DIP RECORDING BOOK**

It is sound policy to keep a dip book listing all information related to the use of the dip.

A dip book will be valuable where several people dip cattle and/or where a property has more than one dip.

The dip book should record:

- a) The date.
- b) The volume of liquid at commencement of dipping.
- c) The number of cattle dipped.
- d) The volume of water added.
- e) The amount of chemical added.
- f) The amount of liquid at completion of dipping.
- g) Analytical results.

## **METHOD OF SAMPLING A DIP FOR CHEMICAL ANALYSIS**

The results of an analysis of the contents of a cattle dip sample are only as good as the sample.

If the sample is not collected correctly, it is a waste of time and effort to analyse it.

The chemicals used in a dip for the control of cattle ticks are not soluble in water; hence it can be difficult to collect a dip sample that is truly representative of the fluid in the dip.

To help keep the chemicals in suspension in the dip, the manufacturer usually adds emulsifiers to the concentrate. A freshly charged dip has the chemical dispersed as very tiny droplets; hence the milky appearance.

During dipping the chemicals tend to attach to particles of dirt and dung that enter the dip. When dipping is finished, these heavy particles sink to the bottom taking the chemical with them. Some chemicals sink faster than others.

## **COLLECTION OF THE SAMPLE**

A satisfactory sample for analysis can only be obtained from a dip after it is well stirred.

Stirring is best done by dipping at least 30 head of cattle.

It is essential to collect the sample while the last animal is still swimming in the dip and the liquid is still "boiling" which means the chemical is well distributed.

The sample must be taken at the "jump-in" end of the dip, immediately behind the last animal and at a depth of about 1 metre (to avoid hair and froth at the top of the dip).

If the sample is taken at the "walk-out" end it may contain fluid returning from the draining pen which will have less chemical in it.

## **SUITABLE CONTAINERS**

The bottle used to collect a sample from the dip should be the one in which the sample is submitted to the laboratory. Use a wide-mouth glass dip bottle (glass poison jars are available from your stock inspector). Do not use a narrow-necked bottle as hair and debris can sit across the neck and act as a filter.

Never use a food or drink container - somebody (especially a child) may think it contains the original product and accidentally drink the liquid. Do not use plastic bottles. The active ingredients of some dip chemicals are absorbed by the plastic and therefore the fluid in the bottle is no longer representative of the fluid in the dip. Do not use containers that have contained other chemicals or the concentrated dip chemical. As chemicals are difficult to wash out, the use of such containers may indicate higher than actual analysis results.

## **SAMPLING DEVICE**

Various sampling devices have been invented to assist in getting the bottle down into the dip to collect the sample.

Contact your local Livestock Biosecurity Officer for advice on these devices.

## **FORWARDING SAMPLES TO THE LABORATORY**

Dip samples should be securely sealed with plastic tape around the lid, packed in the foam container provided, which also must be securely taped, and then further packed in a small box or esky containing absorbent material to soak up any spillage.

**It may be illegal to send dip samples on some public transport.**

Give samples to your Livestock Biosecurity Officer, or delivered them in person to a primary industry government office, or send them by courier with appropriate labelling to:

Chemistry Branch  
Berrimah Agricultural Laboratory  
Berrimah Farm  
Makagon Road  
BERRIMAH  
Telephone: 8999 2276 Fax: 8999 2191

**The following details must accompany the sample:**

- Name of station
- Location of dip on station
- Brand name of chemical used
- Date of sampling
- Contact phone and fax (if possible) numbers

Samples will normally be analysed each week on Thursday.

The results will be faxed, as soon as possible, to the Livestock Biosecurity Officer or station, followed by a report through the mail.

## **POLLUTION**

Excessive pollution in your dip will adversely affect the efficiency of the dip.

Dip chemicals bind onto hair, dung and dirt in the dip thus increasing the stripping rate.

High pollution levels will be reported with the test results.

Cleaning of the dip is recommended if the pollution level is higher than 20%.

## **SAMPLING INTERVAL**

A dip sample should be sent for testing at the start of the season and a second sample should be submitted for retesting if an adjustment has been recommended.

At least two more samples should be submitted for testing during the season to ensure the chemical is maintained at the correct strength.

**Plunge dips used for treating cattle for movement to tick free country must have approval through a certified dip sample with the correct strength within the last three months.**

## RESISTANT TICKS

If you are sure your dip is being maintained at the correct strength and you are still experiencing poor tick control, ask your stock inspector how to collect and handle a sample of ticks for testing for resistance.

## METRIC UNITS

Manufacturers' charge and top-up rates and adjustments recommended by this Department will be given in metric units.

If you work entirely in metric units you should have no problems in maintaining your dip correctly. If however, you continue to convert to the old units, you may end up with disastrous results, such as confusing gallons with litres.

The following table will help you in the use of metric units:

1000 millilitres (mL) = 1 litre (L)

100 centimetres (cm) = 1 metre (m)

1000 millimetres (mm) = 1 metre (m)

1 cubic metre (m<sup>3</sup>) = 1000 litres (L)

## DUTY OF CARE

A person who uses a chemical product has a duty of care to ensure the use does not result in harm to the health of the general public, animals, the environment or domestic or export trade in agricultural produce. Manufacturer label recommendations should be followed exactly at all times.

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