Measuring pasture loss to browsing animals

Before making any decisions in relation to control of pest animals it is essential to know the extent of pasture or crop loss. This information will allow sensible economic decisions on the control needed. For pasture areas, the best way to measure the impacts of wildlife grazing is through the use of exclosure plots.

Figure 1. Simple weld mesh exclosure.

Figure 2. Weld mesh roll exclosure.

An exclosure can be made simply out of weld mesh (approx 1.5m in diameter 5 metres of wire is needed Figure 1), with rabbit 'foot' netting around the base. This will exclude most wallabies and other ground based animals from browsing inside the exclosure, though if there are lots of brushtail possums in your area it would make sense to also cover the top with rabbit wire or some form of netting to also prevent losses to these animals, or use an exclosure with a premade top (Figure 2).

As pademelons, in particular, browse out from the bush edge, it is necessary to place exclosures at different distances from your fence or bushline from where you think the animals are entering.

Only place the exclosures in an area when stock are removed from the paddock, and identify a spot near the exclosure that has pasture of similar height and composition to use as a comparison. At least 3 and preferably 5 exclosures should be used to allow a measure of the variability in the paddock.

Before the pasture is restocked the amount of browsing needs to be measured or there will be confusion between the amount browsed and that eaten by stock.

There are several ways to measure the amount of pasture eaten by wildlife. The simplest is to use a MLA pasture ruler to measure the amount of pasture growth both inside the exclosure and at the spot identified outside the exclosure. This will give an estimate of pasture availability based on an average pasture density. (The pasture ruler and other information on pasture quality are available from **www.mla.com.au**).

To get a more accurate measure of pasture loss a 50 cm x 50 cm area should be cut to ground level from inside each exclosure and a matching one from the marked point outside the exclosure. To ensure accuracy, a quadrat, (a square with an inside measurement of 50 cm made from either wood or steel) can be used to mark the area to be cut. Store the cut pasture immediately in a plastic bag, squeeze out all air and seal the top until weighing or drying. Make sure the samples are kept out of the sun. An estimate of the percentage loss can be calculated from weighing the samples as accurately as possible and using the formula:
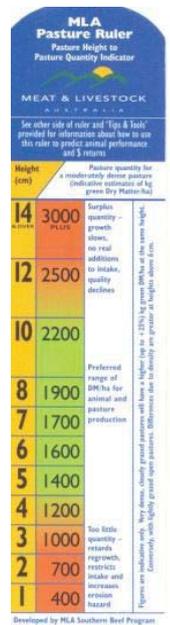
$$\% \text{ loss} = \frac{\text{Wt of sample from inside exclosure} - \text{wt of sample from outside}}{\text{Wt of sample from inside exclosure}} \times 100$$

Also try to estimate the relative proportions of grass and clover in the samples from inside and outside the exclosures as wallabies and possums preferentially graze clover.

An accurate measurement of pasture loss can be made by drying the samples from the quadrats and calculating the amount of feed available. This is the method to be used to get an accurate measure of the loss in Kg of dry matter per ha.

The procedure is:

Weigh the sample before drying, to the nearest gram, and record the weight (W).

- Take a representative subsample of 100 g.

- Dry the subsample in a microwave oven for 12 minutes on high. **It is essential to include a cup of water to avoid the sample burning.**

- Weigh the dried sample to the nearest gram. Put it back in the microwave for a further minute and reweigh. If the dry weight has not changed by more than a gram then record the weight (SS) in grams. Otherwise repeat the previous step.

- Calculate the sample dry weight as below:

$$\text{Herbage mass} = W \times \frac{SS}{100} \times 40 \ (\text{kg DM/ha})$$

The factor of 40 is used because a quadrat of size 50 x 50 cm is 1/40,000 of a hectare and there are 10,000 m^2 in a hectare.

Once you have calculated the pasture mass both inside and outside the exclosure plots you can then convert this into the cost of wildlife browsing.

(Prepared by M. Statham, H. Statham, R. Fish and B. Dolbey, TIA, 2009)