



Managing Pastures - Readers' Note

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<http://www.dpi.nsw.gov.au/agriculture/livestock/dairy-cattle/feed/publications/managing-pastures>

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Allocating pasture and feed

Step 1. Measure pasture on offer

To calculate what quantity and quality of supplements to give, you need to measure the available pasture. Pasture DM can be estimated by eye, or more accurately with a rising plate meter (Figure 23). The meter measures the density of pasture by measuring how much the pasture holds up a standard plate (4kg/m²).

Total DM (on offer) per ha can be worked out from the **basic equation**:

$$\text{kg DM/ha} = (\text{final reading} - \text{initial reading}) \div \text{no. readings} \div 2 \text{ (to convert to cm)} \times \text{pasture factor}$$

Pasture factors:

- **Ryegrass or ryegrass – white clover:** 195 (not valid after stem elongation)
- **Oats:** 185 (not valid after stem elongation)
- **Kikuyu:** 200; for before grazing subtract 1200; for after grazing subtract 1400. (This equation gives DM considered to be available to the animal. It is valid only for hard-grazed pastures or for pastures mulched or slashed after grazing.)
- **Lucerne:** Estimating lucerne DM with the rising plate meter is too inaccurate because of lucerne's stalky nature. DM needs to be estimated from the actual crop height and density. Table 7 (over) shows DM estimates at different plant densities and actual heights for lucerne, and conversions of pasture meter heights to kgDM/ha for the other species discussed.

Available DM, which is always less than **total DM** ('on offer'), is calculated in step 2.

When using the pasture meter:

- take 60–80 readings per block so that the estimate is accurate
- take these readings at set intervals (2–3 paces) across the block
- place the plate of the meter horizontally on the pasture. Do not thump the plate or use it as a walking stick
- treat the meter carefully; bent rods give wrong readings. Use a wire brush every 2–3 weeks to clean the stem and ratchet
- remember that the normal Ellinbank rising plate meter is graduated in ½cm, not 1cm, graduations on the digital readout.

Figure 23. A rising plate meter in use.

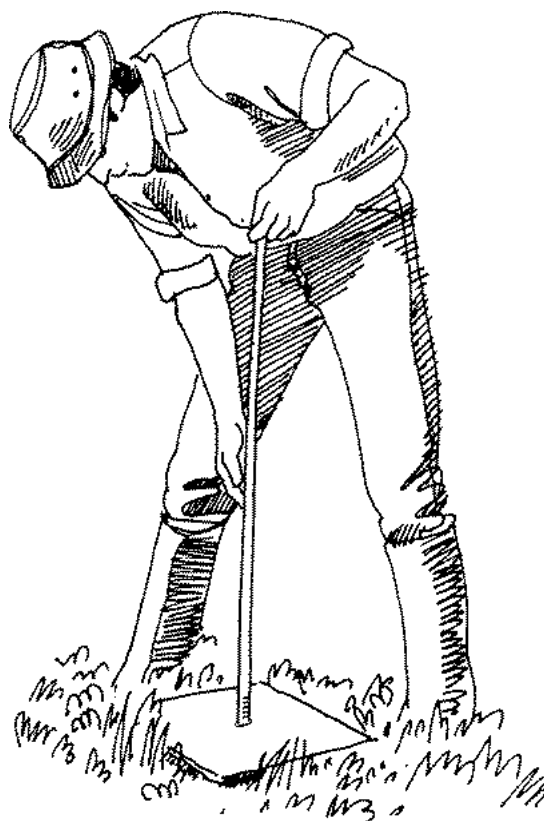


Table 7. Conversion between rising plate meter values (cm) for ryegrass, oats and kikuyu, or actual height (cm) for lucerne, and DM yields (kg/ha).

Pasture height (cm)	Ryegrass, or ryegrass-clover	Oats	Kikuyu		Lucerne	
			before grazing	after grazing	thin	dense
4	780	740	0	–	–	–
6	1170	1110	0	–	–	–
8	1560	1480	400	200	–	–
10	1950	1850	800	600	200	400
12	2340	2220	1200	1000	240	490
14	2730	2570	1600	1400	280	580
16	3120	2960	2000	1800	320	670
18	3510	3330	2400	2200	360	760
20	3900	3700	2800	2600	400	850
25	4875	4625	3800	3600	500	1150
30	5850	5550	4800	4600	650	1425
35	6825	6475	5800	–	800	1700
40	7800	7400	6800	–	1000	2000
45	–	–	–	–	1200	2400

Step 2. Calculate pasture available per cow per day

In step 1, we calculated pasture **on offer**; that is, the total offered to cows. For ryegrass, this is to ground level, but for kikuyu, it is to 5cm stubble height. (The mat below this is considered to be inedible.)

In this step, we now calculate pasture **available**; that is, pasture on offer minus residues left after grazing. Thus, **pasture available** depends on the residue, which in turn depends on stocking intensity, type of stock and actual amount on offer.

For ryegrass, aim to achieve 1000–1200kg DM/ha, or about 5cm, post-

grazing residue. However, it is probably more relevant to determine pasture residues in your situation from the most recently grazed blocks with similar pasture on offer.

In well utilised kikuyu or kikuyu slashed or mulched after grazing, work on utilising $\frac{2}{3}$ of the DM **on offer** above 5cm stubble height. For example, if 800kg DM is **on offer** above 5cm stubble height, then $\frac{2}{3} \times 800\text{kg} = 533\text{kg}$ DM **available**. If there are 50 cows, this comes to $533 \div 50 = 10.6\text{kg}$ DM per cow .

A prerequisite for allocating pasture in this manner is obviously a reasonable estimate of block or paddock size.

The table on the next page shows a worked example.

To calculate:	Example for ryegrass pasture
	meter reading on entering block = 15650; meter reading on leaving block = 16880; no. of readings = 56; residue of 1000 kg DM/ha after grazing; 1.8 ha, 180 cows
DM on offer per ha: take 60–80 readings before grazing and use the equations from step 1 to calculate pasture on offer	$(16880 - 15650) \div 56 \div 2 \times 195 = 2142$ kg DM/ha <i>on offer</i>
DM available per ha: subtract the estimated post-grazing residue	$2142 - 1000 = 1142$ kg DM/ha <i>available</i>
total DM available: multiply by area of pasture grazed per day	$1142 \times 1.8 = 2056$ kg DM available per day
DM available per cow per day: divide by the number of cows	$2056 \div 180 = 11.4$ kg DM available per cow per day

Step 3. Calculate DM supplements per cow per day

To calculate:	Example
Daily feed requirements: maintenance: 5.5 kg DM per cow per day for average Friesians (use 6.5 for large); milk production = 2 L milk/kg DM. Assume daily production = 20 L milk per cow	
feed intake per cow per day: use values for maintenance and milk production	$5.5 + 20 \div 2 = 15.5$ kg DM per cow per day
supplements required: subtract available DM from requirements	$15.5 - 11.4 = 4.1$ kg DM per cow per day

Note that the supplement required is calculated on a dry-matter basis. This will have to be corrected to ‘as-fed’ before feeding stock. For example, you need 4.1kg DM supplements but grain is 91% DM. Therefore you actually need $4.1 \div 0.91 = 4.5$ kg.

Thus cows can be fed to the appropriate level by first determining pasture available.

Many farmers end up simply using the pasture meter periodically to ‘get their eye in’ (that is, to check their estimates), and then estimate DM/ha by eye.